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FOREWORD

The *United States Armed Forces Medical Journal* is the medium for disseminating information of administrative and professional interest to all medical personnel of the Department of Defense. The Assistant Secretary of Defense (Health and Medical) and the Surgeons General of the several services invite all medical officers, dental officers, Medical Service Corps officers, Nurse Corps officers, and officers of the Veterinary Corps of the Armed Forces, and the medical consultants of the Army, Navy, and Air Force to submit manuscripts for publication in this *Journal*.

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Monthly Message

During World War II one of the outstanding surgical accomplishments was in the care of chest wounds. Specialist units of thoracic surgeons functioned in forward combat areas, saving many lives as well as constantly improving technics in surgery of the chest. Similarly during the Korean conflict the field of vascular surgery has advanced to the stage where specialist units of vascular surgeons have become an integral part of military surgical teams. An important factor which has contributed to the improved results of treatment of injured blood vessels is the reduction of the time lag between wounding and operation. This time element is dependent on two factors—speed of evacuation, and the proximity and availability of the vascular team. During the Korean conflict, the man with a major blood vessel injury received surgical attention four hours earlier, on an average, than did his counterpart in World War II.

More than 300 major arteries of the extremities injured in Korea were repaired. Although it is too early for complete evaluation of these patients, only about 30 have required the amputation of a limb. The amputation incidence in World War II following surgical repair of major arteries was about 50 percent. Improved methods in vascular surgery have probably saved some 125 limbs which would have been lost had technics of World War II been used.

In great part this advancement in military medicine has been due to continued research based on experiences of World War II and the Korean conflict which has resulted in the application of a technic which reconstructs an injured blood vessel in continuity.

With the standardization of the armored vest for the combat soldier and marine fewer are killed; but it has resulted in a marked increase in the number and gravity of wounds of the extremities. Under these changing circumstances the application of reparative surgery to torn blood vessels assumes ever increasing significance in the rehabilitation of the wounded.

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THE HOSPITAL ADMINISTRATOR AND COMMUNITY RELATIONSHIPS

PAUL I. ROBINSON, *Brigadier General, MC, USA*

COMMUNITY relationship is something we have whether or not we want it. Our relationship with the public reflects what we are, not what we say we are. Community relationships are everybody's business. A hospital commander's problem is not solved by the presence of a public relations man who may define and defend community relationships but he cannot create it. Community relationships are simply the reflections of the leadership and actions of management. The public relations expert should analyze what people will think, keep management advised and prepare plans, but stay in the background.

KEEP EMPLOYEES INFORMED

Relationships in the community reflect our form of Government. In a democracy the people rule. Therefore in our community relationships everyone must participate. A sense of pride must somehow be instilled in every employee, every patient, every officer, and enlisted person. In their daily conversations with their neighbors, at their churches, in their clubs, they must be proud to say they work at your hospital. They must have some unusual but fine incident they can relate which reflects favorably on their institution. They must be able to tell how busy they are because of the duties that have fallen on them. It is well if the work is competitive for them with a chance to win a certificate or a commendation. They all must be well informed of what is going on in the hospital. When an unusual lifesaving procedure has been performed, everyone should know about it and feel that somehow they contributed to this feat. For a large hospital, a weekly newspaper which is distributed free of charge within the hospital does much to create this impression. For those who win awards or promotions, photographs on the bulletin boards serve to further reward the individual and stimulate others to try for a like recognition. Periodic messages of a general nature from the administrator or commander emphasizing the importance of some accomplishment or some goal or aim serve to get everyone in on the act. This can be done by a general conference or in writing

From Fitzsimons Army Hospital, Denver, Colo. Presented at the Sixth Inter-Agency Institute for Federal Hospital Administrators at National Naval Medical Center, Bethesda, Md., 27 April 1953.

through appropriate media. It can sometimes be done in a subtle but more effective manner by its incorporation in a news item. In short, it is important that management keep employees well informed.

If your mission has been changed or if your funds have been curtailed so that a reduction in force is necessary, your plan for effecting the change should be immediately announced so that everyone can begin to plan. This should be done even though you know that alterations may have to be made in your plan, but you should also publish these alterations as promptly as they are formulated. Management must take careful cognizance of suggestions made by employees. This gives everyone a chance to be heard and the action is accomplished with much less resentment. It is well to have suggestion boxes and a committee to consider every suggestion no matter how trite it may appear. Good suggestions should be well rewarded. All suggestions should be acknowledged by a polite and appreciative note. Complaints must be heard in a tolerant atmosphere and sincere effort must be made to either correct or explain the underlying cause. Complaints can be kept to a surprising low number if everyone is kept well informed day by day.

PATIENT-HOSPITAL CONTACTS

The patient is the other person whose thoughts and remarks will do much to determine what your community thinks of your institution. He is the recipient of what you have to offer. He really knows if you are what you say you are. He meets family, friends, and acquaintances daily when he can be in a physical state which does not contribute to his desire to spread good public relations. His first contact with the hospital, therefore, must engender confidence. This contact may be the ambulance driver and attendants. The patient does not expect too much of them, but he does expect them to be concerned about his comfort and to recognize that he is ill. He expects them to be reasonably gentle and he expects them to move him to the hospital in a reasonable length of time. His next contact may be at the admitting office. He is not resentful at giving certain personal information but he is most resentful if he is left uninterviewed for any appreciable length of time, particularly if he can see the persons manning this office working on records or otherwise employed rather than caring for his immediate problem.

His next contact is on the ward. He expects everyone there to have immediate concern for him. He is gratified if the nurse has his room or bed ready. If he has to wait in the corridor, he becomes unhappy and concerned regarding the efficiency of that unit. He is in strange surroundings and he wants someone who will answer his questions without delay. Whether the questions

are answered decisively or not does not matter. But if he wants to know when he will have his x-ray and if the nurse or attendant can say, "The doctor will see you this afternoon and determine that" or "The doctor says you are to rest two days before you go to x-ray," he is satisfied. If he is told, however, "I have no orders for you to go to x-ray" or "You'll go to x-ray if you need an x-ray," he immediately builds up a subconscious doubt as to whether or not these people know what they are doing.

DOCTOR-PATIENT RELATIONSHIP

The doctor-patient relationship also is most important. The armed services, at present, are working under some handicap, in that many of the physicians are in military service involuntarily. Occasionally the physician may transmit his dissatisfaction to the patient and the patient, in turn, may feel antagonistic or sympathetic to the physician, either of which is not a correct relationship. It is desirable that every patient feel that he is the most important patient the physician has and every utterance and action of the physician is for his benefit alone. It is my belief that physicians in general, whether or not they are serving voluntarily, are interested in the welfare of patients and that they expend all their energies toward improving the lot of the patient.

OCCUPATIONAL THERAPY

Long-term patients require much more than professional care to become enthusiastic hospital rooters. They may or may not have hobbies. If they have particular tendencies toward writing, reading, inventing, furthering their education, or learning handiwork of any type, they must be given instruction or help. In this connection, one of our chronically ill patients invented the "autronic eye" in use for the first time on 1953 automobiles. He had the idea and part of the knowledge; our educational units were able to get together the books, the materials, the assistance necessary for him to carry on and the result was the purchase of his invention by General Motors. The librarians, the occupational therapists, the educators, the Red Cross workers all have a monumental task in satisfying the whims, the desires, and the ambitions of patients. The actions of these groups contribute a great deal to the public relations of your hospital. It is a great source of satisfaction to sign from 10 to 20 letters of congratulations per month to patients because they have completed some phase of an educational program. Some finish grade school, some high school, and some gain college credits, but the important thing is that every one of them has done something useful and beneficial for himself about which he can be proud and concerning which he can boast.

EXTERNAL FACTORS

All of this is what we can do internally. This is the core of the community relationship problem because those within the hospital know what your hospital really is regardless of what the newspapers, the radio, and other media say it is. But external relationships are also important, the first of these being your information office. Visitors to patients, prospective patients, contractors, bidders, employee applicants, in fact everyone who comes into your hospital is entitled to prompt centralized and personalized information. The information clerk is one of the most important members of the staff and his principal asset is a pleasant personality. He or she cannot be expected to know all the answers, but apathy or lack of interest or unpleasantness cannot be tolerated in an information office. If the information office is located some distance from the entrance to the reservation or hospital, a convenient method to follow to reach it is most important: "Follow the yellow line" or some such device. Administrators would do well personally to select their information personnel if they desire to link this important asset to their community relationship.

Some communities are easy to enter; others, more difficult, but every community has some event where, if nothing more, they need scenery. They need someone in a uniform or some federal official to add to the dignity of the occasion. By all means, go. Before long you will have met some of the prominent citizens in all walks of the community. You may be asked for a golf game, a hunting trip, a duck shoot—accept and go. You may want to ask someone for an occasion at your hospital. By all means do so. See to it that the mayor, the chief of police, the chairman of the school board know something of your hospital and its problems. Soon you will be asked to speak at some luncheon club. Do so but keep your remarks strictly within the time limit; compliment their organization on whatever it is trying to do. Never fail to plug the importance of your own organization and by all means stick absolutely to the facts. If you are speaking to an organization of business men, talk about your hospital as a business; if to a group of educators, discuss what you are doing along educational lines. Remember that everyone is interested in what you are doing with regard to healing the sick. In an amazingly short time you will have a speaking acquaintance with civic leaders, rotarians, members of the chamber of commerce, the newspaper editors, the entertainer control groups, Kiwanians, Optimists, Toastmasters, and even technical organizations.

You will have requests for patients to appear at various affairs. Intelligent patients who will make intelligent remarks should be selected. One never knows when they will be asked to make remarks.

You are less likely to have difficulty with the professional societies. It is highly important that good relationships be maintained with all of them. Having a meeting of the medical society, the dental society, the laboratory technicians, or the hospital administrators at your institution once a year is not a difficult task. In some instances this meeting is the big meeting of the year—it is anticipated by the members. It is always wise to have something unusual but good on your program so that a doctor attending can say that he saw this work at your hospital.

Physicians, dentists, and others on your staff should be encouraged to speak to professional groups both in the community and elsewhere. They should prepare their data carefully and should present the subject matter competently.

In any community there are always demands for speakers on general subjects. In any organization there are always a few who like to speak. These should be made known to the public relations man so he can co-ordinate the speakers and the request.

One other item of importance in community relationships is the prompt and polite answering of correspondence. Everyone is entitled to have an answer to any question he may have. Although he may be greatly dissatisfied, a prompt forthright reply will do much to place him on your side in the future.

SUMMARY

Community relationships are with us whether we want them or not. To make them good rather than bad is our goal. Our public relations expert can give us technical guidance. Many times he can tell us what to do and when, why and how. Community relationships depend upon the actions of management because they are a direct reflection of what our institution is rather than what anyone may say it is. We must work both internally and externally to accomplish a good community relationship goal. We must do more than the minimum in the community. We must go beyond what the people expect. A good simple rule is to be sure all of the actions of management are in good taste, that they are handled with good temper and that effort is always made to put forth good talent.

COMPROMISE TREATMENT OF SEVERE MALOCCLUSION IN ADULTS

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SEVERE dental malocclusion frequently has been observed in military personnel. Although they have a sufficient number of teeth for satisfactory mastication of the usual ration, their malocclusion is such that it would appear that masticatory efficiency is at a minimum. The rationale of treatment and a review of the corrective procedure in several patients is reported.

The optimum time for correction of dental malocclusion is in the young person prior to the attainment of complete appositional growth of the jaws. If a patient with a malocclusion is not treated until after major growth has taken place, the dentist can no longer depend on moulding or redirecting the formation of the jaws. In such instances, the treatment must often be a compromise between the facilities available, the status of the dentition, and the ideal occlusion.

There are a number of approaches to the correction of severe malocclusion in the adult. The choice is dependent on the degree of the malocclusion, the objective to be attained, and the availability of time, equipment, and skilled personnel. The patient must be considered with respect to the classification of his deformity; the number, condition, and position of the remaining teeth; the status of the supporting structures; and the feasibility of correction. The type of treatment used may be: orthodontia, surgical correction, a prosthesis, or selective grinding. In many instances, combinations of these are necessary to achieve a satisfactory result.

The patients reported here were treated by selective grinding. This method was chosen because of its relative simplicity combined with the degree of improvement which was possible. It was a compromise because the basic malocclusion was not changed nor was there much improvement in esthetics. Time consumption

From 97th General Hospital, U. S. Army. Capt. Stewart now at 1005 Harvey Bldg., West Palm Beach, Fla.

was minimal and the risk of an operation was not incurred. In all instances, the end result was considered better than could have been obtained with a prosthetic appliance.

Selective grinding, or equilibration of the dentition by grinding, is not a haphazard procedure in any sense. It has specific objectives which the dentist must keep in mind as well as definite limitations which must be observed. Even in a malocclusion, it is dangerous to assume that harm cannot be done by indiscriminate removal of tooth structure. Unless great care is exercised, patients treatable by conservative methods can develop complications by the well-intended but misdirected efforts of the dentist.

OBJECTIVES FOR EQUILIBRATION PROCEDURE

Schuyler[1] presented an excellent outline of the objectives for the equilibration procedure. These are to (1) correlate centric occlusion with an unstrained centric maxillomandibular relation; (2) obtain maximum distribution of occlusal stress in centric maxillomandibular relation; (3) retain the maxillomandibular opening; (4) equilibrate the steepness of similar tooth inclines, thereby distributing eccentric occlusal stress; (5) establish smoothness of guiding tooth inclines; (6) reduce the incline of guiding tooth surfaces so that occlusal stresses may be more favorably applied to supporting tissues; (7) retain the sharpness of cutting cusps; (8) increase the food exits; and (9) decrease the contact surfaces. These objectives as well as a technic for equilibration of the human dentition have been discussed in another article.[2] Some variations occur in treating patients with severe malocclusion as compared to the management of the usual case of traumatogenic occlusion.

MALOCCLUSIONS TREATED

Maxillomandibular opening. The treatment for an open bite requires a reduction of its vertical dimension in order to bring the anterior teeth into a functional relationship. This may be done by reducing the height of the posterior teeth or, in extreme instances, by removing several posterior teeth and replacing them with an adequate prosthetic appliance. Occasionally, it is necessary to increase the length of the anterior teeth with veneer or jacket crowns in addition to reducing the vertical dimension. Because the routine equilibration procedure should not reduce the vertical dimension, treatment of an open bite calls for a radical departure from the measures ordinarily followed to prevent closing the bite.

Overbite and overjet. In an open bite, the effort is to establish an incising bite. If the lower anterior teeth are posterior to the upper teeth, the bite should be closed until incisal contact

is established in the protrusive excursion of the mandible. In some instances, it is prudent to compromise for good function in one lateral movement only, rather than to try to provide incisor contact with both lateral and protrusive movements. Patients with an anterior cross bite also require a compromise. When the lower anterior teeth are located anterior to the upper teeth while the mandible is in its centric position, the dentist usually cannot hope to establish function in the anterior segment. An exception to this can be brought about by removing some teeth and establishing functional contact by the insertion of a prosthetic appliance. In the absence of such extensive measures, incisive function may be established in one or both cuspid areas. In patients with a moderate anterior cross bite, an end-to-end contact can often be established for the anterior teeth because the patient usually has an acquired centric position. Often, the premature contact is caused by the anterior teeth.

Posterior cross bite. The usual way for recontouring the teeth to establish lateral excursions is by grinding the buccal cusps of the upper teeth and the lingual cusps of the lower teeth. In cross-bite relationships, this must be reversed. The lingual cusps of the upper teeth and the buccal cusps of the lower teeth should be recontoured to provide the smooth lateral excursions. The principle of providing opposing incline-plane contact for the centric position remains the same, but the distribution is slightly altered because the lingual cusps of the lower teeth occlude along the sulci of the upper teeth.

Posterior end-to-end contact. Occasionally the majority or all of the posterior teeth are so placed that only the cusp apexes contact in the centric position. In such instances, not only is the centric position difficult to establish but the lateral movements are ill defined because there is no opening movement with the lateral excursion. In these instances, the dentist should endeavor to close the bite sufficiently to create some degree of interdigitation of the teeth for a definite centric position. From this position, inclines can be formed which will provide the vertical opening during the lateral movements. The extent to which these two objectives may be attained will vary greatly but the dentist should not be satisfied until enough interdigitation is secured to provide a definite centric position.

Reverse compensating curve. As the bite is closed in the presence of a reverse compensating curve, or curve of Spee, the grinding should be directed to reducing the reverse curve toward a more normal relationship. This is accomplished by recontouring the last upper molar more extensively than the last lower molar. The next molars receive more nearly equal attention while the upper first molars or bicuspids are passed over at the expense of the opposing lower teeth. In this manner, a compensating curve

may be established, or at least enough of the reverse curve may be eliminated to permit anterior contact during the protrusive movement of the mandible.

OUTLINE FOR EQUILIBRATION

The most important aspect of correcting malocclusion or traumatogenic occlusion is to be able to visualize the final result before grinding is started. It is easy to become disoriented after grinding has progressed. Strict adherence to the treatment outlined and completion of one step before passing on to the next is essential otherwise a satisfactory occlusion will be unlikely. A convenient routine for equilibration is:

1. Determine the path toward the true centric position by observation of the mandibular movement, palpation, auscultation,[3] and the use of articulating paper.

2. Locate the first premature contacts in the path toward true centric position.

3. Remove the premature contacts, keeping in mind the need for conserving tooth structure for final occlusal contact. Deepen a sulcus if more interdigitation is desired or reduce a cusp if less interdigitation is indicated.

4. Repeat steps two and three until the marks indicating centric contact are properly distributed and the centric position is stable with the desired vertical dimension established. Inclined-plane contacts should be balanced so that the resulting vector of force will be directed along the long axis of each tooth.

5, Establish smooth lateral excursions by adjusting the teeth for one working bite first, and then its balancing bite without interfering with the centric contacts. Proceed to the opposite working bite followed by its balancing bite.

6. Adjust the protrusive excursion. If the cusp inclines have been adjusted properly and the compensating curve has been established, there should be little recontouring necessary to provide functional contact of the incisors, but if the malocclusion is so severe as to make incisor function impossible, the cuspid areas should be adjusted to provide an incising bite.

7. Smooth and polish all roughened surfaces, being careful to avoid altering the centric-contact areas.

CASE REPORTS

Case 1. A 31-year-old man was seen for dental evaluation because of the possibility that his masticatory inefficiency was contributing to vague stomach complaints. Several years prior to admission, his upper anterior teeth, apparently hypoplastic, had been removed in order to improve his appearance and to provide

better function. The prosthesis failed to satisfy either objective. The patient did not feel that his deformity was progressive nor was he particularly disturbed by the fact that he was forced to swallow food with little chewing. He avoided fibrous foods and tough meats as much as possible. On several occasions he had been told that all of his upper teeth should be removed and replaced by a denture for better appearance and function. He was reluctant to accept that solution for his problem.

Dental examination revealed an Angle class III malocclusion (fig. 1A) with an open bite anteriorly and a cross bite posteriorly. The upper right second and third molars presented minimal occlusal contact with the lower right second and third molars. The upper left second and third molars occluded with the lower left third molar. His other teeth were not functional in any position of the mandible. The upper right and left first molars and the lower anterior teeth were hypoplastic.

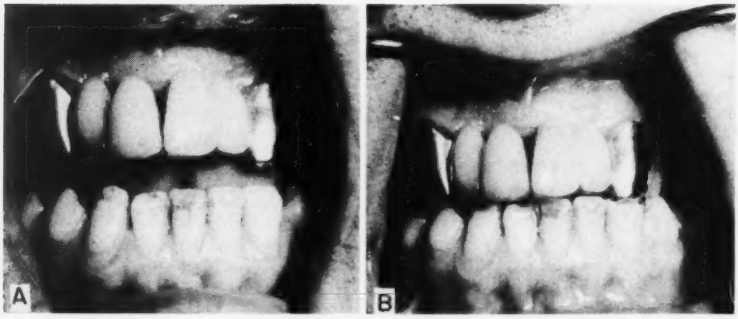

Figure 1 (case 1). (A) *Before treatment.* (B) *After treatment.*

Selective grinding or equilibration was completed with the vertical dimension reduced to permit an end-to-end incisor relationship. The degree of occlusal contact was increased and smooth, balanced, lateral excursions were provided for the cross-bite relationship (fig. 1B).

Case 2. A 23-year-old man was seen for routine dental examination. His only complaint was difficulty in masticating some foods. Some recontouring had been done on the anterior teeth several years prior to this examination but no attempt had been made to provide better function.

The patient was found to have an Angle class III malocclusion (fig. 2A) with bilateral posterior cross bite and an open anterior segment. The lower third molars, the lower left second molar, and the upper right third molar were missing. The occlusal surfaces of the remaining posterior teeth were from moderately to extensively worn.

Figure 2 (case 2). (A) *Before treatment.* (B) *After treatment.*

Selective grinding was done with the degree of closure of the bite limited by the relative thinness of the enamel remaining on the posterior teeth. An end-to-end anterior relationship (fig. 2B) was achieved with balanced cross-bite function established for the posterior teeth.

Case 3. A 20-year-old man was seen for dental evaluation following his complaint of being unable to masticate the usual ration. Prior to his entry into the military service, the patient had lived at home where the food was prepared to his particular requirements. Although the patient was slightly obese, he insisted that he had great difficulty masticating sufficient food in his present environment, in spite of the fact that the deformity was not increasing in severity. He had been urged to have all teeth removed and replaced by subsequent prosthesis in order to provide greater masticatory efficiency.

Dental examination revealed a severe Angle class III relationship with only the third molars and the left second molars in centric contact. There was an anterior open bite (fig. 3A) and bilateral posterior cross bite. All first molars and the lower right second molar were missing. The mandible was massive in appearance and the tongue seemed larger than normal.

With the mandible in centric position, only the left posterior teeth were functional. There was no possibility of decreasing

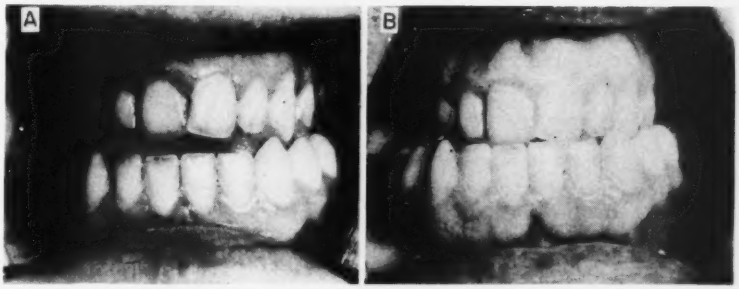

Figure 3 (case 3). (A) *Before treatment.* (B) *After treatment.*

the anteroposterior space in the anterior region, nor could the bicuspids on the right side be considered potentially functional. Accordingly, centric balance was established by the contact of the right third molars and the bite was closed sufficiently to create function in the left posterior region. The left cuspid area was adjusted to provide an incising bite with a right lateral excursion of the mandible (fig. 3B).

Case 4. A 19-year-old man was seen for dental evaluation following a recommendation that all his teeth be removed because of severe malocclusion and "pyorrhea." He had no complaints and his history was noncontributory.

Examination revealed an Angle class III malocclusion with a left posterior cross bite and an acquired centric position. The anterior teeth presented premature contacts (fig. 4A). There was no tooth mobility. Radiographically, the alveolar bone, the alveolar crests, and the lamina durae throughout the mouth ap-

Figure 4 (case 4). (A) *Before treatment.* (B) *After treatment.*

peared normal. Mouth hygiene was very poor with resultant heavy calculus formation and marginal gingivitis.

This patient was treated by removal of local irritants and selective grinding to establish a stable, true centric occlusion and smooth lateral excursions. When the true centric position was established, the anterior teeth were in a functional end-to-end relationship (fig. 4B). Satisfactory equilibration of both centric and lateral movements was secured in spite of the unilateral cross-bite relationship. The vertical dimension appeared to have been increased slightly with the newly established occlusal contacts.

DISCUSSION

In the dental requirements established for selective service (AR-40-115), malocclusion is no longer a factor in the acceptance or rejection of personnel for military service. Many persons with more than moderate malocclusion are accepted into the services.

Most had been told by civilian as well as military dentists that the only solution to their malocclusion was a full-mouth extraction, and replacement by full dentures, or the acceptance of their condition as permanent and unremediable.

Operative procedures and extensive prosthetic replacements are both risks in value and take time. Because such dental surgery is elective for a condition that existed prior to induction, failure could involve the Government for many years of professional and monetary responsibility. Such patients are all aware of their condition and desire that something be done. As has been shown in these four patients, excellent functional and esthetic results may be obtained without drastic surgery and extensive prosthesis.

The age group of these made the proposal of full-mouth or multiple extractions unacceptable to them. By the judicious use of selective grinding and equilibration, excellent end results were obtained. The patients were not subjected to prolonged uncomfortable treatment of a severe nature. They were kept from their training a minimum amount of time and were not incapacitated to a greater extent than they were normally accustomed to in masticating the issued ration.

This type of care has a definite place in the dental treatment rendered by the military dental services. It accomplishes much for a patient without a great loss of time or by incurring the liability of the Government for future claims. Potential liability is most important in the elective treatment of conditions existing prior to entry into military service.

SUMMARY

The treatment of four adults with malocclusion is significant because (1) corrective procedures were not initiated early and (2) it demonstrates the degree of benefit that can be secured from the simple but exacting selective grinding technic. Although the corrective procedure is completed with a minimum expenditure of time, it is an irreversible procedure and requires careful evaluation prior to its initiation as well as precise operating technic in its execution.

REFERENCES

1. Schuyler, C.: Correction of occlusal disharmony of natural dentition. *New York State Dent. J. Dentistry* 13: 445, Oct. 1947.

2. Stewart, J. M.: Correction of traumatogenic occlusion. Submitted for publication in *J. Florida State Dent. Soc.*

3. Stewart, J. M.: Diagnosis of trauma togenic occlusion. Submitted for publication in *J. Florida State Dent. Soc.*

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A NEW ANTICOAGULANT FOR ROUTINE LABORATORY PROCEDURES

A Comparative Study

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THE disodium salt of ethylenediaminetetraacetic acid, hereafter referred to as EDTA (sequestrene, disodium versenate), was first investigated in Germany by Dyckerhoff et al.[1] This compound exhibited an anticoagulant action in vitro but not in vivo. Apparently, anticoagulation is due to the binding of calcium ions to the agent. The properties of this anticoagulant were recently studied further by Proescher,[2] who found that it was a better blood preservative than sodium citrate or potassium oxalate. Small quantities (from 0.005 to 0.01 ml. of a 10 percent aqueous solution) will keep 5 ml. of blood from coagulating.

The effect of EDTA on nine routine blood chemistry tests and its suitability for general hematologic procedures have been investigated and are presented in this report.

METHODS

Blood from normal donors and patients with tuberculosis was used in this study.

Hematologic studies. The effects of three anticoagulants on the packed cell volume, the white cell count, and the leukocyte morphology were studied. Five milliliters of freshly drawn blood were placed in five Kahn tubes, each containing one of the following: (a) 0.1 ml. of a 1 percent heparin solution; (b) 0.03 ml. of a 10 percent EDTA solution; (c) 0.1 ml. of a 10 percent EDTA solution; (d) 2 mg. of powdered EDTA; (e) double salt of potassium and ammonium oxalate; 0.5 ml. of the solution dried at 60° C. The packed cell volume of these specimens was determined in Wintrobe tubes 1, 24, 48, and 60 hours later. White cell counts and stained films were made 1, 6, and 24 hours after drawing the blood. Leukocyte morphology and other features of the blood

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smears were studied by the "buffy coat" technic as described by Beerman.[3] Between determinations all samples were kept in the refrigerator at 4° C.

Chemical studies. The comparative effects of two commonly used anticoagulants and EDTA on the performance and results of nine routine chemical tests were investigated. The anticoagulants used were: 0.15 ml. of a 1 percent heparin solution, 0.15 ml. of a 20 percent potassium oxalate solution, and 0.15 ml. of a 10 percent EDTA solution, each per 10-ml. sample of blood. The efficacy of each of the three anticoagulants on each of the nine chemical determinations studied was repeated on an average of eight separate blood samples. Tests for the following were performed: sodium and potassium, using the Baird flame photometer[4] with lithium internal standard; chlorides, both the iodometric[5] and mercuric nitrate methods;[6] creatinine;[7] uric acid;[8] inorganic phosphates;[9] blood urea nitrogen;[10] blood sugar;[8] and plasma bicarbonate by the titration method.[11] After the introduction of the anticoagulants the preliminary handling of all samples was identical.

RESULTS

Packed cell volume. The heparin and EDTA tubes agreed very closely, within 1 percent, both at 1 and 24 hours. No difference was noted among the three concentrations of EDTA which were employed. The potassium oxalate tubes demonstrated from 2 to 5 percent variation from the heparin tubes, and always showed an increase in packed cell volume after 24 hours. Varying degrees of hemolysis were evident in the potassium oxalate tubes. This condition was also present in the heparin tubes, though to a much lesser degree, while the EDTA tubes showed almost no hemolysis after 24 hours.

The buffy coats in the EDTA tubes appeared intact as did the platelet layers. Both were less distinct in the heparin tubes and were almost indiscernible in potassium oxalate. This condition was even more pronounced after 24 hours.

Stained films. The observations based on the microscopic examination of slides prepared identically are summarized in table 1. Observation of the three EDTA preparations are presented as one, because no difference in morphology resulted from the three concentrations employed. The cells preserved with EDTA appeared smaller in size as compared with oxalate preserved cells. Many shrunken white cells were seen in the heparin preparation. The staining characteristics of the EDTA preparations were far superior to the other two.

TABLE 1. *The effect of three anticoagulants on blood smear morphology*

Observations	Time interval (hours)	Anticoagulants		
		Potassium oxalate	Heparin	EDTA
Autolysis of cell nuclei (polymorphonucleocytes and lymphocytes)	1	+	++*	–
	6	++	++	+
	24	++++	++	++
Clarity of morphology	1	+++	+**	++++
	6	++	+	+++
	24	+	+	+++
Quantity of platelets	1	++++	++	++++
	6	++	+	++++
	24	+	+	++++
Stainability	1	++++	++	++++
	6	+++	++	++++
	24	+++	++	++++

*Cells distorted and poorly preserved.
**Cells very hazy.

TABLE 2. *The effects of three anticoagulants on the white cell count*
(Percentage change over a 24-hour period)

Anticoagulant	Change in 1 hour (percent)	Change in 1 vs. 6 hours (percent)	Change in 1 vs. 24 hours (percent)
Potassium oxalate	*	1.4	25.1
Heparin	4.3	33.3	43.0
EDTA (a) 0.03 ml. of a 10 percent solution.	1.2	4.8	17.0
(b) 0.10 ml. of a 10 percent solution.	1.5	4.9	9.3

*Used as standard.

TABLE 3. *Effect of three anticoagulants on nine chemical procedures, showing mean and mean deviation*

Chemical determinations	Potassium oxalate (Mg. %)	Heparin (Mg. %)	EDTA (Mg. %)	Serum (mEq./L)
Creatinine	1.15 ± 0.06	1.25 ± 0.06	1.24 ± 0.05	
Blood urea nitrogen	16.2 ± 0.9	16.2 ± 1.1	16.0 ± 1.0	
Glucose	126.0 ± 12.0	125.0 ± 12.0	124.0 ± 9.0	
Phosphorus	3.3 ± 0.2	3.4 ± 0.2	3.3 ± 0.2	
Uric acid	4.3 ± 0.3	3.9 ± 0.5	4.3 ± 1.0	
	(mEq./L)	(mEq./L)	(mEq./L)	
Sodium	128.4 ± 5.2	143.7 ± 2.1	155.1 ± 3.1	143.6 ± 1.8
Potassium	Not tested	4.2 ± 0.3	4.3 ± 0.4	4.8 ± 0.2
Chlorides (iodometric titration)	106.6 ± 0.8	108.6 ± 1.3	101.9 ± 2.5	107.7 ± 1.8
Chlorides (Schales & Schales)	108.1 ± 3.5	112.4 ± 2.6	118.6 ± 3.0	112.0 ± 3.5
Plasma bicarbonate (titration method)	27.4 ± 1.0	28.3 ± 1.5	21.8 ± 1.2	

White cell counts. Over 160 white cell counts were performed. The differences between the three anticoagulant preparations are shown in table 2. Within an hour after drawing the blood there was very little difference in the effects of the three compounds on the cell count. After six hours a rather large drop in the white cell count occurred in the heparin preparation. This condition was even more pronounced after 24 hours, at which time the count had decreased by 50 percent in many instances and the cells had a tendency toward clumping in the counting chambers. The decrease in white cell count after a 24-hour period was very much less with EDTA and potassium oxalate.

In order to estimate the accuracy of the counting technic, a series of 10 counts was performed on the same blood sample; the mean difference between counts was 360, which is equivalent to a 5.0 percent error in this series of counts. The same person read all the counts in this study so as to keep variation of technic to a minimum.

Blood chemistry tests. A comparison of the effects of three anticoagulants on certain blood chemistries is shown in table 3. No difference was seen in creatinine levels when heparin and EDTA were used; a slight drop was noted with potassium oxalate. No variation was observed in the blood urea nitrogens with any of the anticoagulants. The results of the blood glucose determinations were within 1 percent of each other. The mean values were high because the blood specimens were from nonfasting patients. No significant difference was noted among the phosphorous determinations. A small variation was noted in the blood uric acid test, the levels of the heparinized samples being slightly lower than those of the other two agents. Using a serum control in the sodium and potassium determinations revealed large inconsistencies, the levels in the heparinized samples being comparable to those in the serum, while the levels in the EDTA samples were high and those in the potassium oxalate samples were very low. The oxalate preparations were not tested for potassium.

Some variation was seen in the results of the blood chloride determinations. With the iodometric method the EDTA treated samples were low, and with the mercuric method of Schales and Schales the results were invariably high. In the latter procedure most of the increase was accounted for by testing the EDTA solution alone; this averaged 7.2 mEq./L of chlorides. The low results obtained with EDTA in the iodometric method cannot be explained. Good agreement was seen in both methods between the heparinized plasma and the serum sample. Fair agreement was seen between the results obtained with potassium oxalate and heparin in the plasma bicarbonate procedure. No reason can be given for the low results obtained with EDTA.

DISCUSSION

EDTA appeared superior to heparin and potassium oxalate as an anticoagulant for the routine hematologic procedures of packed cell volume determination, white cell count, and blood smear morphology. This superiority is manifested in the observations presented in tables 1 and 2. Our data on packed cell volumes substantiated the work of Wittgenstein.[12] If the hematologic examinations can be done within an hour of drawing the blood, potassium oxalate is nearly as good as EDTA. If the examinations must be delayed as much as 6 hours, then EDTA is preferable to potassium oxalate. Heparin should not be used as an anticoagulant in this type of work.

In evaluating the merits of EDTA for use as an anticoagulant for blood chemistries, one should remember that the compound contains two atoms of sodium and has powerful binding properties. The sodium in the compound accounts for the difference between the heparin and the EDTA determinations in the blood sodium levels. It is difficult to explain the low sodium level when potassium oxalate is employed.

Excellent agreement was obtained with all three anticoagulants in a number of chemical tests: creatinine, blood urea nitrogen, blood glucose, phosphorus, and uric acid. In the potassium determination, the results obtained with heparin and EDTA were similar.

The chloride results are more difficult to interpret. Using the Schales and Schales method, the heparin and potassium oxalate readings were very similar, whereas the EDTA reading was always higher. EDTA solution alone gave a sizable reading with this method, but with the iodometric method the EDTA results were consistently low and potassium oxalate was slightly lower than heparin.

On the basis of cost, EDTA is far more economical than heparin. In relative concentration, heparin costs about 160 times more than EDTA which in turn costs five times as much as potassium oxalate.

SUMMARY

EDTA is superior to heparin or potassium oxalate in preserving the formed elements of the blood for hematologic examination in the laboratory. It is much more economical than heparin but more expensive than potassium oxalate. It does not require refrigeration. EDTA may be used for a number of blood chemistry determinations.

REFERENCES

1. Dyckerhoff, H.; Marx, R.; and Ludwig, B.: Über den Wirkungsmechanismus und die Verwendbarkeit einiger blutgerinnungshemmender organischer Substanzen. *Ztschr. f. d. ges. Exper. Med.* 110: 412-422, 1942.
2. Proescher, F.: Anti-coagulant properties of ethylene bis-iminodiacetic acid. *Proc. Soc. Exper. Biol. & Med.* 76: 619-620, Apr. 1951.
3. Beerman, H.: L. E. cell and phenomenon in lupus erythematosus. *Am. J. M. Sc.* 222: 473-481, Oct. 1951.
4. *Baird Associates Flame Photometer Manual,* Baird Associates, Inc., Cambridge, Mass., 1952. Section 5.
5. Van Slyke, D. D., and Hiller, A.: Application of Sendroy's iodometric chloride titration to protein containing fluids. *J. Biol. Chem.* 167: 107, 1947.
6. Schales, O., and Schales, S. S.: Simple and accurate method for determination of chloride in biological fluids. *J. Biol. Chem.* 140: 879-884, Sept. 1941.
7. Bonsnes, R. W., and Taussky, H. H.: On colorimetric determination of creatinine by Jaffe reaction. *J. Biol. Chem.* 158: 581-591, May 1945.
8. Fister, H. J.: *Manual of Standardized Procedures for Spectrophotometric Chemistry.* Standard Scientific Supply Corporation, 1950.
9. Fiske, C. H., and Subbarow, Y.: Colorimetric determination of phosphorus. *J. Biol. Chem.* 66: 375-400, Dec. 1925.
10. Looney, J. M.: Determination of blood urea nitrogen by direct Nesslerization. *J. Biol. Chem.* 88: 189-195, Aug. 1930.
11. Haskins, H. D., and Osgood, E. E.: Modifications of Van Slyke's titration method for estimating alkali reserve of blood. *J. Lab. & Clin. Med.* 6: 37, Oct. 1920.
12. Wittgenstein, A. M.: Disodiumethylenediamine tetra-acetate. *Am. J. M. Technol.* 19: 59-62, 1953.

The psychiatrist of today is expected to be an oracle of wisdom who sits on high, judging and prognosticating, not only the interpersonal trends of man's relationships, but also the political, socioeconomic, educational, criminal, and forensic aspects of his behavior. This has come about largely because of the progressive incursions that the knowledge of modern psychology has made on man's variable interests in civilization. The responsibilities involved for the psychiatrist in dealing with these social problems presume on his capacity for applying exact methodologies to problems of group or mass, as for individual psychology. The overwhelming current problems of divorce, racial prejudice, and democracy are challenges that daily face the psychiatrist, though scientifically he may not be ready for them. But in time he shall have girded his loins and met these social challenges just as he has been meeting the challenge of individual personality.

—S. ROTHENBERG, M. D.
in *Journal of Nervous and Mental Disease*

PSYCHIATRY IN THE KOREAN CAMPAIGN

A Historical Review (1)

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AS the Korean campaign progressed, constant changes in the administration of the psychiatric support of the troops were necessary.

THE CHINESE COMMUNIST OFFENSIVE
26 November 1950 to 15 January 1951

On 25 November 1950, the Eighth Army began an all-out offensive in the western sector of the north Korean front to coordinate with the attack of the X Corps in the east in an effort to reach the Yalu River and quickly end the campaign. The Eighth Army attack proceeded unopposed for almost 2 days. On the night of 26-27 November, several fresh Chinese Communist armies counterattacked all along the line, with a major thrust at the right flank of the Eighth Army, then composed of a ROK Corps. The ROK troops rapidly collapsed, exposing the flank and rear of the 2d Infantry Division and the Turkish Brigade. The position of the other units of the Eighth Army was untenable and they promptly withdrew to the Pyongyang area to avoid envelopment. The 2d Infantry Division and the Turkish Brigade were forced to fight their way out of entrapment during which enemy roadblocks and flank attacks caused disorganization and produced heavy casualties.

During this withdrawal, divisional medical support was necessarily restricted to emergency care and evacuation. The holding of any patient for intradivisional treatment was impossible and impractical. Even meager medical support was difficult to accomplish in the 2d Infantry Division because 5 of their medical officers were lost in the retreat. Despite the large number of battle casualties, there were relatively few psychiatric casualties. These were evacuated to Army medical facilities. Intradivisional psychiatric treatment did not become operative until early in December, when the evacuation of Pyongyang was completed and stabilized defensive positions

(1) The second of two installments.

(2) Brooke Army Medical Center, Fort Sam Houston, Tex.

along the 38th parallel were established. For several weeks thereafter the enemy contact was slight and serious fighting was not resumed until late in December.

The 2d Infantry Division was placed in army reserve for rest, retraining, and absorption of replacements.

Similar massive Chinese Communist assaults in northeast Korea forced the withdrawal of the X Corps. In the mountainous Chosin Reservoir district, the 1st Marine Division and elements of the 7th Infantry Division were forced to fight their way out of encirclement. Their almost continuous 10-day battle to reach safety included the air evacuation of thousands of injured and wounded men from improvised rapidly constructed airfields, severe physical deprivations, intense cold, and overwhelming numerical superiority of the enemy, who attacked from all sides. Despite the large number of wounded, injured, and frostbitten patients, there were relatively few psychiatric casualties. Here again was a situation where there was little or no obvious gain in psychiatric illness. Plane evacuation was uncertain and used mainly for the physically disabled; all others had to fight their way out in a do-or-die manner.

On 9 December, a relief column, mainly composed of 3d Infantry Division and Marine elements reached the retreating column. By 11 December all U. N. troops had withdrawn to the coastal plain within the perimeter defenses of the X Corps. There followed a gradual evacuation by sea as the defensive perimeter, mainly manned by the 3d Infantry Division, strongly supported by the guns and planes of naval vessels standing off shore, was progressively narrowed. Total evacuation was completed on 24 December. The X Corps troops were brought into southern Korea, where they became an organic part of the Eighth Army.

Offensive Renewed

The end of December saw a renewal of the Communist offensive against the insecure defense line of the Eighth Army along the 38th parallel. The U. N. troops resumed their orderly withdrawal, and by 4 January 1951 the enemy recaptured Seoul. By 7 January the Eighth Army had withdrawn to a line along the general level of Pyangtek in the west and Wonju in the center. Here stubborn resistance was offered to further enemy advances. At Wonju, early in January, the 2d Infantry Division, with the attached French and Dutch Battalions, made a firm stand against severe enemy onslaughts. This successful defensive engagement marked the end of retreat for the Eighth Army as they consolidated a line of defense across the waist of South Korea.

The lowered spirits of the troops was not reflected in the psychiatric rate, but rather in the increased amount of disease and number of nonbattle injuries, including self-inflicted wounds. The inclement weather caused respiratory and other infectious diseases and no doubt the numbing cold and icy roads were responsible for much frostbite and accidental injury, yet many psychiatric casualties were concealed among the numerous soldiers evacuated for subjective complaints and nondisabling conditions, particularly among the many allegedly frostbitten patients who had only subjective complaints and no objective findings. This syndrome of "cold feet" was compounded out of the usual numbing sensation of the feet in cold weather, a conscious or unconscious wish for the gain of illness, and poor motivation. One can only speculate as to the greater vulnerability to frostbite of the potential psychiatric patient. It may be that the increased sympathetic stimulation, in such a fear-ridden person, caused excessive vasoconstriction of the extremities with a consequent decrease in blood supply. If this is a factor, it might account for the lessened incidence of psychiatric casualties noted at a time when frostbite casualties were so numerous. The increased incidence of self-inflicted wounds was another expression of the loss of manpower for psychologic reasons. Almost invariably it was explained by the person concerned as a combination of numbed fingers and carelessness. The environmental conditions made it seem reasonable to expect many such unavoidable errors, yet the relatively innocuous character of most of the self-inflicted wounds and their occurrence in safe, rear positions, where there is no cause for haste, indicated the purposeful nature of the alleged accident. The increase of other types of accidental injuries tended to confirm the viewpoint that the dispirited and unhappy soldier may become apathetic to an injury that may possibly redound to his personal benefit and remove him from a traumatic environment. In this vein, a signpost noted on a highway in Korea in May 1951 was quite apropos. It read as follows: "Never fear; rotation is here; accidents unnecessary; drive carefully."

AWOL Rate Low

In further considering the loss of manpower from psychologic causes, it should be realized that relatively few men from United States troops were AWOL from battle. This is in sharp contrast to the numerous instances of this overt reaction to fear and deprivation that occurred in the ETO in World War II. There were simply no safe or comfortable places to go. It was dangerous to leave one's unit and wander in the rear because of guerrilla activity and the weather. The only escape from the hazards and discomforts of Korea was through medical channels.

It is for this reason that in December and January a more accurate indication of the manpower loss for psychologic causes can be found in the increased incidence of disease and injury, rather than the relatively low psychiatric rate that reflected lessened enemy contact during that period.

Army psychiatric facilities were prepared to support the divisional psychiatric program. The previously mentioned plan of establishing a forward psychiatric center at the 64th Field Hospital in Pyongyang was implemented on 27 November. Sufficient accommodations for 100 patients were made available in a building adjacent to the main hospital area. The previous center at the 4th Field Hospital, near Seoul, remained in operation and the 8054th Evacuation Hospital in Pusan, the most rear hospitalization point in the Eighth Army, had a small psychiatric unit. The X Corps sector in northeast Korea was served by the psychiatric section of the 121st Evacuation Hospital, supported by the psychiatric service of the hospital ship *Consolation.*

Psychiatric Personnel Dispersed

Army psychiatric personnel were deliberately dispersed, rather than concentrated in any one area or unit, by assigning 1 or 2 psychiatrists to the various hospital units strategically located to receive most of the patients. This arrangement served a dual purpose. *First,* it provided alternate treatment facilities in the event of the dislocation of forward centers due to serious battle reverses, thereby insuring a continuation of Army psychiatric service particularly needed in any large withdrawal when intra-divisional care is not feasible. *Second,* such a dispersion made it possible for psychiatric facilities to be adapted to air evacuation. Most patients from the forward areas in the Korean campaign were evacuated by air. This rendered difficult, if not impossible, the triage of psychiatric patients to any one area or hospital. Whether patients were brought to this or that hospital depended on the weather, the condition of landing strips, the number of vacant beds, and, although rarely, the desires of the flight crew. For this reason it was necessary that psychiatric facilities be situated wherever large numbers of all types of patients were brought for treatment.

As a result of the Communist offensive late in November, thousands of wounded and sick patients poured into Pyongyang by plane, train, ambulance, and truck. Available medical facilities were rapidly over-taxed, forcing prompt re-evacuation to medical units in the Inchon-Seoul area and Pusan. All psychiatric casualties were brought to the 64th Field Hospital. Admissions of this type did not exceed 20 per day and were relative-

ly few compared to the large number of wounded. This was even more surprising because there was little prior screening by the division psychiatrists, who were on the move with their medical units. Most of the psychiatric casualties were of the mild or moderate type, readily treated by physical restorative measures and superficial therapy. Patients who could not be returned to combat were evacuated to the 4th Field Hospital for prompt disposition to noncombat duty. The confused tactical situation about Pyongyang made limited duty assignment from this area impractical, except for some patients placed on duty temporarily with the medical detachment of the 64th Field Hospital, which was understaffed and desperately needed all possible help to perform their mission.

When it became evident that our position in Pyongyang was untenable, the 64th Field Hospital prepared to close down and its psychiatric team moved to the 4th Field Hospital to form the main psychiatric unit in the Eighth Army. The 4th Field Hospital also became the principal hospitalization center in Korea. The hospital staff demonstrated energy and resourcefulness in rapidly improvising added facilities to receive the large influx of casualties. Early in December the 4th Field Hospital had about 2,000 beds in operation and provided temporary quarters and messing for personnel of the 64th Field, 171st Evacuation, and 10th Station Hospitals, and nurses from 3 mobile surgical units. The professional personnel from these hospitals participated in the treatment of the large patient load.

Rapid Treatment Methods Used

Facilities and personnel were adequate to treat the daily average of 30 psychiatric admissions. The effectiveness of treatment steadily improved. The rapid treatment methods used by the psychiatrists helped orient their medical and surgical colleagues to adopt a similar management of mild illness and of those patients with only subjective complaints *(3)*. As a result, from 150 to 200 patients of all types were daily returned to duty from the 4th Field Hospital.

The large influx of casualties caused by the Chinese counteroffensive again overflowed medical facilities in Japan. As before, most of the evacuees were flown to southern Japan, where the 118th Station Hospital at Fukuoka functioned as an evacuation hospital, retained nontransportable patients for treatment, and transferred the remainder by plane and train to hospitals in Tokyo and Osaka. For a brief period in November and December, the 118th Station Hospital received over 1,000 patients daily. The capacity of the hospital was enlarged to

1,600 beds and a smoothly functioning medical and administrative team that received, treated, fed, and sorted thousands of patients during this hectic period was perfected.

Early in December the 141st General Hospital was ordered to Camp Hakata, 18 miles from Fukuoka, in order to increase the medical facilities in southern Japan and lessen the burden on the 118th Station Hospital. Their psychiatric service was in a strategic location to receive most of the psychiatric casualties evacuated from Korea. Adequate facilities for 200 neuropsychiatric patients were set up in an area, separated from the main hospital, that had sufficient space for an outdoor recreational program. This plan became operative in the latter half of December. By early January, the psychiatric service of the 141st General Hospital had over 100 patients. It became apparent that an electroshock therapy apparatus, an EEG machine, and more substantial closed-ward facilities were needed for complete coverage in neurology and psychiatry in this region. Steps were taken to realize such an objective.

The 361st Station Hospital in Tokyo received most of the psychiatric casualties that arrived in Japan late in November and early in December. At this time a number of recently arrived psychiatrists were present at the 361st Station Hospital. They included 5 young naval medical officers with civilian training in psychiatry and neurology. Without exception they were receptive to material concerning the concepts and therapeutic technics of combat psychiatry. The available pool of new psychiatrists made possible the implementation of the previously described plan of decentralizing psychiatric facilities. The assignment of psychiatrists to the various hospital centers was quickly reflected by a lower admission rate to the 361st Station Hospital. Hospital commanders uniformly agreed that the medical service rendered by their units was improved.

Two convalescent hospitals were established in Japan. Both units, one at Omiya, 25 miles from Tokyo, the other at Nara, about 25 miles from Osaka, began receiving patients on 9 December. They were designed to relieve congestion in the major hospitalization centers by removing organically ill patients who required from 2 to 3 weeks of convalescent care before their return to duty. This made available in the fixed hospitals hundreds of beds that were vitally needed for the influx of fresh casualties who required active surgical or medical treatment.

Use of Convalescent Units

From the psychiatric standpoint, the opening of the convalescent units was an event of the first magnitude. It made available

a realistic environment for psychiatric therapy which combated the vexing secondary gain in illness, unwittingly fostered by the comfortable atmosphere of the usual fixed hospital. In contrast, the convalescent hospital put its patients in fatigue clothing and had a full daily program of calisthenics, marches, athletic activities, and training. Patients under this regimen found little benefit in clinging to symptoms and were not adversely affected by suggestive evidence that evacuation to the United States was possible. Psychiatric patients were deliberately dispersed among those recovering from organic disease who gave little support to their neurotic complaints. The psychiatrist operating in such an environment found less resistance to psychotherapy as the patient turned more to the therapist for support and assistance (*4*).

One psychiatrist each was assigned to the Nara and Omiya Convalescent Hospitals and another to the 155th Station Hospital in Yokohama to reopen the psychiatric outpatient and consultation clinic that had been dormant since the 141st General Hospital had been transferred to southern Japan.

The end of this period found psychiatric facilities in Japan well staffed and so distributed as to implement a full-scale psychiatric program aimed at the outpatient and convalescent treatment of ambulatory nonpsychotic patients and at the inpatient care of psychotic and neurologic patients in 3 psychiatric centers, strategically located in major hospitalization areas.

THE UNITED NATIONS WINTER OFFENSIVE
15 January to 22 April 1951

By 15 January, the momentum of the Communist attack had been reduced and the U. N. forces turned to aggressive patrolling. On 21 January the U. N. operation (Operation Killer) of employing armored counterattacks, supported by infantry, air, and artillery, and designed to inflict a maximum number of enemy casualties with minimum losses to ourselves, was begun. By the end of January our limited offensive had reached north of Suwon and Inchon. In February, the U. N. offensive continued scoring gains against stubborn resistance, and by 14 February our troops had seized Inchon, Kimpo Air Field, and secured a line along the south bank of the Han River. Vicious enemy delaying actions followed and these continued until the middle of March. The Communists used road mines and dug-in positions. They destroyed bridges and demonstrated their ability to hold hills by repeated counterattacks. Their resistance diminished by mid-March and they withdrew, fighting only rear guard actions as our forces recaptured Seoul and pushed north toward the 38th parallel. It was known that the Communists were building up a powerful reserve striking force. Yet they offered only

sporadic resistance and by 8 April all enemy east of the Injim River had been driven out of South Korea. Bitter opposition occurred thereafter, particularly against our offensive moves in the central and eastern sectors.

The winter offensive campaign caused an increase of our battle casualties and a consequent rise of the psychiatric rate, which remained at this higher level through February, March, and April, paralleling the aggressive U. N. tactics, but the psychiatric rate never reached the level that could be expected from the uphill combat in such a bleak, desolate, frigid environment. There were many reasons for the relatively low incidence of neuropsychiatric casualties. The battle line was more secure, with none of the rear infiltration and confusion that plagued our forces in previous periods of the Korean campaign. Enemy positions and territory were methodically and carefully taken, with an obvious regard for sparing the life of the infantrymen. Operation Killer was well named and publicized as a procedure calculated to destroy the enemy with less emphasis on capturing ground. The resurgence of morale was a remarkable phenomenon. Defeatism was turned to grim determination and finally to aggressive confidence when it became apparent that concentrated fire power and carefully planned assaults could overcome the previously feared human-wave tactics of the Communists. An added factor was good medical discipline. The experienced divisional medical officers had learned to appraise the subjective complaints of the unwilling soldier realistically and firmly closed the door of medical evacuation, except to mentally or physically disabled patients. Last, but not least, was rotation. This most pertinent morale factor gave hope to the men that relief was possible. The first rotatees left Korea on 18 April.

The psychiatrists had consolidated and organized their functions within the divisions. Aid stations were regularly visited and battalion surgeons indoctrinated as to their role in treatment and evaluation. The division psychiatrists were consulted by line and administrative officers on matters of morale, mental health, and special personnel problems and gradually became emancipated from the restricted role of merely treatment and evaluation of patients referred to them.

Psychiatrist Shares Combat Dangers

It is a curious but regularly observed fact that when the psychiatrist visits forward areas and makes personal contacts, he becomes more highly regarded by the combat personnel. His very presence demonstrates that he shares their viewpoint and interests. The psychiatrist, by such trips, gains for himself firsthand knowledge of the problems of the combat officers, both line and medical. His recommendations display a practical understanding of the battle situation and insure a more ready accept-

ance by the combat leader. Basically, the visits of the psychiatrist make possible the phenomenon of identification, which on the one hand involves the sharing by the psychiatrists, even for a short time, the trials and tribulations of combat troops and, on the other hand, involves the sharing by the combat line and medical officer the efforts of the psychiatrist in the prevention and early treatment of emotional breakdown. The division psychiatrist who remains in the rear is not considered to "know the score" by combat personnel. He is resented as one who fears to share their hardships and therefore does not belong in their world of deprivation and trauma. In a certain sense this viewpoint of the forward personnel is correct, even though based on unreasoning emotional factors, for the psychiatrist can best objectively evaluate the manifestations and feelings of his patients when he possesses some of the background experienced by them.

Self-Inflicted Wounds

The psychiatrist of the 7th Infantry Division made a study of self-inflicted wounds and found that 20 percent of such patients came from the new divisional replacements. This survey, supported by the division surgeon, influenced the divisional commander to establish battle indoctrination for infantry replacements. The investigation made it logical to conclude that relative unfamiliarity with weapons plus numbing cold more readily permitted the ego to accede to a more or less unconscious wish for accidental injury and medical evacuation. The institution of from 7 to 10 days' training in the 7th Infantry Division caused a prompt decrease of self-inflicted wounds. It proved to have the further beneficial effect of giving the newcomer more confidence in himself as he learned battle tactics under experienced combat leaders. Under such conditions of training, the insecure replacements were especially motivated to absorb the knowledge imparted because they were frankly told that this instruction was akin to life insurance. In the process of such battle indoctrination the new infantrymen began to experience group identification because they were taught that they could survive as part of a team. The training period was also proof-positive that his leaders considered his welfare and safety. All in all, this preliminary instruction to the newcomer was a pertinent and valuable morale factor and a great improvement over placing the new and tremulous recruit into battle with no alleviation of his inevitable anticipatory anxiety. From both the 1st Cavalry Division and the 25th Infantry Division psychiatrists came information to the effect that over half of their psychiatric casualties had about 9 months of combat service and were veterans of the early fighting in July and August 1950. Such patients were considered to have the "old sergeants syndrome" described in World War II.

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In all combat divisions, the division psychiatrist made the holding platoon of the clearing company his permanent base of operations. Psychiatric patients were sent to this platoon for evaluation or treatment. The holding unit was located in a rear position in respect to the other 2 clearing platoons and, therefore, not subjected to as frequent dislocation as the other platoons, which were more sensitive to the changing tactical situation of the division. Patients with mild organic disease were also treated in the holding platoon to which usually 2 general medical officers were assigned. The presence of medical officers in this treatment platoon obviated the need for a professionally trained assistant division psychiatrist. It was not difficult to orient one of the young assigned medical officers in the use of the relatively simple physical and psychologic measures employed at this level. The division psychiatrist was seldom absent for more than 24 hours so that all evaluations and major decisions were made by him. The "assistant division psychiatrist" was mainly concerned with initiating or continuing routine treatment. In addition, the division psychiatrist had several enlisted assistants who had some previous psychiatric experience. Their services were invaluable in the management and observation of patients at this level. They were also useful in obtaining histories and gathering information for routine reports.

Policy on Fitness for Combat

In March an informal army and theater policy that gave the division psychiatrist control over decisions as to fitness for combat duty at the division level was established. It was believed that the psychiatrist operating within the combat group was in a better position to estimate the soldier's ability to perform combat duty than his colleagues further back. When the psychiatrist in the forward area decided that a patient was temporarily disabled for divisional duty, he added the initials DSB (don't send back) to the diagnosis of combat exhaustion. This was honored by the next psychiatric echelon in hospitals of the Eighth Army. Division psychiatrists were enjoined not to predicate the decision of the rear psychiatrist as to the fitness of patients for noncombat duty in Korea or Japan by indicating such a recommendation either directly to the patient or on the medical record. In essence, psychiatrists restricted their recommendations for duty to the particular level in which they functioned. By this method, the return of patients to combat by rear psychiatrists was prevented when the division psychiatrist had made a decision as indicated by the designation "DSB." In cases where the DSB designation was omitted, the decision for or against combat duty was the function of the rear echelon psychiatrist. In effect, this policy fostered respect for

the opinion of the individual psychiatrist, avoided iatrogenic tramua to patients, and allowed the receiving psychiatrist to make proper disposition of the patients.

The division psychiatrists did not abuse their control over this criteria for combat duty because uniformly they were motivated to keep as many men as practicable on duty within the division. They were active in obtaining reassignment within the division for battle-weary riflemen or other neurotically handicapped persons who could be effectively used in a less strenuous position at regimental and division headquarters or service units.

Another phase of the informal psychiatric disposition policy concerned persons with character and behavior disorders who in ordinary times were treated administratively under the provisions of AR 615-368 and AR 615-369. Previous experience in World War II and current experience in the Korean campaign strongly indicated that relatively few patients could be discharged under AR 615-369 in a combat unit because there was little time for administrative procedures and such a general discharge under honorable conditions would be construed as a reward for ineffectiveness, with a consequent undesirable effect on the morale of the unit. Moreover, in wartime, persons in this category (AR 615-369) can be profitably employed in noncombat assignments because their personality defects are not so severe as to preclude their functioning under less stressful conditions.

It was agreed that the division psychiatrist would evacuate such milder personality problems that could not be reassigned within the division. The next psychiatric echelon would then reprofile the evacuee and recommend a rear assignment. As a result of this procedure, it was demonstrated that most such patients could and did function effectively in noncombat positions when such a disposition was firmly made and the person pointedly reminded of his good fortune. Even enuretics were treated by this method and became useful rear echelon soldiers when it was made clear to them that their problems from a practical standpoint mainly involved the availability of laundry facilities, of which there was no dearth in Korea or Japan. In time, the use of AR 615-369 became rare in the Far East Command. Such a reward is impractical in an overseas theater in wartime because of its deterrent effect on motivation. It was only used on men with severely inadequate personality when it was evident that marked ineffectiveness in military life duplicated an inadequate civilian existence and they were literally incapable of being motivated toward effective work of any kind.

Pathologic Personalities

Persons with pathologic personalities classified under AR 615-368 were *not* evacuated through medical channels but treated by administrative and disciplinary measures within the division. These included narcotic and alcohol addicts, habitual shirkers, antisocial persons, and those with chronic disciplinary problems. This policy was based on the assumption that soldiers of this type could not be rehabilitated by reassignment. Infantry divisions in the combat zone have relatively few persons of this type. There is little opportunity for the usual disciplinary disorders, and AWOL is a serious offense. Alcohol and drugs are relatively scarce and addiction is much less of a problem. In the 25th Infantry Division, only 12 dispositions under AR 615-368 were made in a year of combat. The fact that discharge under AR 615-368 is undesirable effectively limits the number of these discharges in the battle environment that insists on the giving up of selfish goals, and the denial of rewards for un-co-operative and antisocial behavior.

The disposition of noneffective officers was solved satisfactorily in March 1951. Previously, officers who demonstrated their unsuitability as combat leaders by reason of poor motivation or personality defects were either evacuated through medical channels or referred to their units for administrative action. Neither method proved to be effective. On the one hand, the combat units did not have the time or the administrative machinery to cope successfully with the unwieldy process of AR 605-200. On the other hand, medical evacuation was an obvious reward for poor performance. As a result of these difficulties the Eighth Army Headquarters established a permanent AR 605-200 board under the direct supervision and control of the Eighth Army Judge Advocate General to process all cases that arose in that army. This promptly removed the administrative burden from the combat units, who were then more willing to recommend action of this type rather than press their medical officers to use medical evacuation. By virtue of more expert guidance and accumulative experience, the permanent board was readily able to accomplish the prescribed procedure. The use of this permanent board became a uniform practice for the elimination of noneffective officers and, in my experience, which included similar difficulties in World War II, this centralized method has proved to be the most effective solution to this vexing problem. After 6 months of operation 45 officers had been processed under AR 605-200, and the proceedings against 13 of these were pending approval from Washington. The fact that final action from the Department of the Army takes an average of 3 months, during which time the officer concerned is of no use to the Army, constitutes the major weakness in this procedure. It would seem more advantageous either

to allow Army Headquarters or Theater Headquarters to take final action in a wartime theater in such cases, or permit the already boarded officer to return to the United States and there await the final decision of the Department of the Army.

Psychiatric Centers

In the early phases of this period, the 4th Field Hospital at Taegu continued to be the main psychiatric center of the Eighth Army. There were no particular changes in the clinical syndromes observed at this time, except in the proportional decrease in the number of patients with free-floating anxiety in favor of those with displacement on somatic complaints. Headache, backache, fatigability, urinary frequency, and gastrointestinal difficulties in that order were the most common symptoms. Physical hardships from the cold and inclement weather coupled with the monotonous diet seemed as traumatic to the soldier as combat stress. A large percent of the evacuees from forward areas had mild injuries, disease, or diagnostic problems. The treatment and disposition of such patients at army level rather than evacuation to Japan was especially encouraged. The salvage of men for duty was also stimulated by a directive from the theater commander who enjoined the Medical Service to make all possible efforts toward prompt rehabilitation of patients and to prevent their unnecessary hospitalization or evacuation.

The main Eighth Army Headquarters was also located in Taegu, thus placing the psychiatric center of the 4th Field Hospital in a strategic position to give advice and consultation for the many administrative and medicolegal problems commonly encountered in a large headquarters.

In February, another psychiatric center was opened at the 10th Station Hospital in Pusan. This was a welcome relief to the overworked psychiatric section of the 3d Station Hospital (previously the 8054th Evacuation Hospital).

The 121st Evacuation Hospital, after its withdrawal from northeast Korea in December, became operational at ToxondDong, about 20 miles from Taegu. Its site was a frozen rice paddy, and rarely have I seen hospital personnel in such poor spirits. They were cold and miserable, living in tents off the main channel of evacuation. There was not even the solace of hard work that usually acts as a tonic to medical personnel who disregard physical discomfort when performing necessary functions. In February, the unit was moved to Taejon. Morale promptly improved as everyone became busy establishing and operating a winterized hospital, using the existing station hospital buildings as a nucleus. The assigned psychiatrist initially received relatively few patients in this location because the condition of the air-

field at Taejon did not permit its frequent use. In March, the unit moved to Yondongpo, near Seoul, and early in April was established in Seoul. In this location, the hospital was in the most favorable position to receive casualties from the combat area and the psychiatric section soon became quite active.

Further progress was made in the organization and development of the psychiatric service in Japan. It had been the usual policy to evacuate most Korean casualties by air to southern Japan, from which point most of the evacuees were shipped by air and rail to hospital centers in Tokyo and Osaka. This entailed a duplication of handling and hospitalization in Japan that was time consuming, required additional personnel, and delayed definitive treatment. The Surgeon of the Japan Logistical Command had endeavored for sometime to have air evacuation routed directly to the various hospital centers in Japan, but sufficient planes were not available until January to put this plan in operation. The hospital centers in Tokyo and Osaka received 40 percent of the casualties from Korea and 20 percent were sent to the medical facilities in the Fukuoka area in southern Japan.

From the psychiatric standpoint, the change in air evacuation was fortunate because the 3 psychiatric treatment centers were strategically situated, obviating the necessity to transfer psychiatric patients within Japan. The location of the 2 convalescent hospitals near Tokyo and Osaka, respectively, was also a convenient arrangement because it allowed the triage of ambulatory psychiatric casualties directly to the convalescent hospital, thus by-passing the fixed and more luxurious medical installation for a more realistic treatment environment. Psychotic, neurologic, or other litter neuropsychiatric patients were sent to the psychiatric center located in the fixed hospital.

The greater effectiveness of a convalescent type of environment over that of a fixed general hospital, in the treatment of nonpsychotic psychiatric patients became obvious even in the early part of this period. As time passed, psychiatric therapy in convalescent hospitals was steadily increased as evidence that only severe mental reactions required treatment in a fixed installation accumulated. At Omiya about 350 psychiatric patients were treated (75 with barbiturates and hypnotic interviews). Ninety percent of the 350 patients were returned to noncombat duty; the rest were transferred to the 361st Station Hospital, because of psychotic or neurologic findings. Similar results were obtained at the Nara Convalescent Hospital.

Physical Profiling

The many difficulties inherent in the assignment of reprofiled (limited service) personnel were clarified during this period. Ex-

isting Army Regulations that allowed for a temporary change of physical profile were used as a basis for a theater directive which stipulated that persons so profiled be marked for "noncombat duty in Japan only." A limited service category is a necessity in a combat theater overseas, otherwise large numbers of persons who would be quite capable of performing duty in one of the service corps would be returned to the United States for medical reasons. This procedure operated satisfactorily as long as there were sufficient vacancies in units in Japan to absorb the reprofilees. By January, it became increasingly difficult to find noncombat assignments in Japan and the following changes in the use of limited duty personnel were effected:

1. The limitation "for Japan only" was deleted from the recommendation for assignment. This opened more opportunities for the use of noncombat personnel in Okinawa and in rear areas in Korea.

2. Re-examination within 90 days for all reprofilees was made mandatory. The status of persons found fit for full duty was continued for another period of from 1 to 3 months. This procedure served partially to control the ever-increasing number of limited service personnel.

All reprofilees in Japan were re-evaluated in February and March. A surprising result was obtained from those in the psychiatric category when from 30 to 50 percent were found fit for full duty. Although the criteria for return to full duty was not uniform, all psychiatrists had been instructed to consider a person fit for combat if he were free of overt anxiety or its somatic displacements, nightmares, and insomnia, and could return to combat without a recurrence of disabling symptoms. All examiners reported that many welcomed a decision to return them to full duty, expressing a desire to prove themselves and to remove the feelings of inferiority that had been present since their removal from combat. This reclaiming of psychiatric casualties after several months of noncombat duty is a new procedure in military psychiatry. Unfortunately, no follow-up studies are available to determine their effectiveness after restoration to combat. This much is known: on repeated questioning of the division psychiatrists in later months, it was rare to find persons with such a history among their patients. Perhaps this favorable result was due to the influence of rotation that became fully operational in May and gradually removed the reprofiled combat personnel. Despite the absence of exact information as to its effectiveness, there is sufficient data to indicate that such a reclaiming process is a practical procedure and should be given further trials. There are powerful forces which impel the soldier who has had an emotional breakdown to return to combat. They are discernible in the battle dreams and irritability of the neurotic casualty who constantly returns to the

traumatic situation that he was unable to master. When forward psychiatry is operating effectively, the combat casualty who is salvagable usually is returned to duty at the division or army level, but when circumstances do not permit efficient combat psychiatric methods, as occurred in the early days of the Korean campaign, many reclaimable soldiers are rapidly evacuated and subsequently placed in noncombat positions.

Arrival of New Units

Another major event occurring during this period was the arrival to Japan of 3 numbered general hospitals. The 279th General Hospital became operational at Camp Sakai, near Osaka and the 382d General Hospital, at Konoka Barracks in March; the 343d General Hospital was placed on a standby basis at Camp Drew, 50 miles from Tokyo, and did not become operational until 1 October. The pre-existing psychiatric facilities were adequate so the psychiatric services of the 3 new hospitals were used only for consultation service and the personnel made available by this plan were absorbed in other assignments.

In March, plans were made and approved to rebuild the closed facilities of the 141st General Hospital. Electroshock therapy apparatus was obtained and placed in operation. An electroencephalograph was ordered.

The 40th and 45th Infantry Divisions arrived in Japan during March and April. The 45th Infantry Division was sent to Hokkaido and the 40th Division to northern Honshu. Their mission was the defense of Japan, and they began an active training program to reach combat readiness as soon as possible. Each division had a psychiatrist. The psychiatrist of the 45th Infantry Division also acted as the psychiatric consultant to the 161st Station Hospital which supported the division in Sapporo, Hokkaido.

THE SPRING CAMPAIGN
22 April to 10 July 1951

The so-called "first impulse" of the long-awaited Communist spring offensive began on 22 April with enemy onslaughts in the central and western sectors. By 25 April enemy attacks were launched all along the line. The U. N. forces withdrew in an orderly fashion to halt enemy penetrations in the west, toward Seoul, and in the east central region, toward Chunchon. The U. N. withdrawal to consolidated positions forestalled further Communist efforts. By 28 April the U. N. forces formed an arc just north of Seoul, from which our lines ran due east for 20 miles, then northeast to the east coast near YangYang. At some points we had withdrawn as much as 40 miles.

Despite the sudden impact of battle, the increase in combat casualties, and the overrunning of our forward positions, there was no particular rise in the incidence of psychiatric casualties. The rapid and orderly withdrawal of our troops broke contact with the enemy, removed battle stress, and gave time for physical recuperation. This confirmed previous observations that psychiatric casualties are not increased during a retreat. The post-offensive lull that followed was due to the inability of the enemy to continue the offensive because of poor logistical support. This period lasted for more than 2 weeks, during which time our patrols sought contact with the enemy and there was a limited offensive by ROK forces in the eastern sector. The decreased incidence of psychiatric casualties at this time was consistent with the low rate of battle casualties in general.

The "second impulse" of the Communist offensive began on 16 May, with the brunt of the attack in the east central sector. For 5 days, ceaseless assaults were directed at the 2d Infantry Division which blocked enemy efforts to exploit a penetration of adjacent ROK divisions. The truly heroic stand of the 2d Infantry Division resulted in a large number of battle casualties and psychiatric breakdowns. The U. N. forces in this area were pushed back 15 miles. The 3d Infantry Division was moved to bolster the eastern sector and by 21 May the enemy attack was contained.

The Counterattack

For the first time in the Korean campaign, the U. N. forces promptly passed to the attack after halting an enemy offensive. The counterattack threw the Communists into a disorganized retreat. By 28 May the 38th parallel was again reached, 12,000 prisoners were taken, and a total of 100,000 enemy casualties inflicted since the beginning of their April offensive. The low incidence of psychiatric casualties for the second half of May reflected the high morale of a victorious, rapidly advancing offensive, despite the many battle casualties.

The U. N. offensive continued through early June, but against stiffening opposition. On 13 June, strategic Chorwon and Kumhwa were seized and by 15 June the U. N. forces generally reached their objectives and were deployed in a strong line from 15 to 20 miles north of the 38th parallel. Patrol action marked the remainder of this tactical phase as peace-talk rumors culminated in the beginning of truce negotiations on 10 July.

The increase in the number of psychiatric casualties in the first half of June was to be expected in the presence of slow uphill fighting against determined opposition.

Division psychiatry was performed in an experienced effective manner during this period. About 60 percent of the patients were returned to combat. The enemy offensive of 22 April forced the withdrawal of the 121st Evacuation Hospital from Seoul to Taejon and thus out of the main evacuation channel. Psychiatric evacuees were not numerous and were readily cared for by treatment units in Taegu and Pusan. In May the 121st Station Hospital returned to Yondongpo, on the south bank of the Han River, across from Seoul. This was an excellent site, strategically located to receive and evacuate casualties by air and rail, that soon made the unit the major hospital center for all types of patients and the psychiatric center of the Eighth Army. The 11th Evacuation Hospital arrived in Korea in May and became operational at Chungju, off the main evacuation route and a great distance from the combat area. It was mainly used for the holding and treatment of patients with minor wounds, injuries, and disease.

The spring offensive in Korea produced only a slight increase in the psychiatric patient load in Japan. Screening and salvage by division psychiatrists and Army treatment units had become progressively more effective so that about 90 percent of psychiatric casualties were returned to combat and noncombat duty in Korea. Most of the remainder, evacuated to Japan, were suffering from psychotic reactions, neurologic disorders (mainly unconfirmed epilepsy), and severe neurotic reactions. It became increasingly rare to find among the psychiatric evacuees patients capable of being returned to combat from Japan. Minor reactions and character disorders originated mainly from service units in Japan and were usually treated on an outpatient basis. The total psychiatric inpatient census in Japan remained at about 300, with 150 at the 361st Station Hospital, 50 each at Osaka Army Hospital and the 141st General Hospital, and the rest scattered among the small psychiatric units of other medical installations. About 100 patients, most of whom had psychoses or neurologic problems, were evacuated to the United States each month. This represented about 5 percent of all the patients evacuated to the United States from Japan.

Rearrangement of Psychiatric Personnel

The major problem in Japan during this period was the rearrangement and replacement of neuropsychiatric professional personnel. Six naval medical officers, on loan to the Army since December 1950, were returned to Navy control in June. They had performed in a superior manner and played an important part in the development of the psychiatric program in the FEC. An equally difficult loss to absorb at the same time was the return to the United States of 5 Regular Army physicians from Japan and 4 from Korea.

The most serious professional shortage was in the field of neurology. Five of the 6 neurologists in the theater were in the group returned to the United States. The neurologist who remained was transferred to the 361st Station Hospital in June to insure a continued functioning of the most important neurologic center. New arrivals to the theater during this period, who partially offset our professional losses, included 9 psychiatrists.

The problem of obtaining electroencephalographic technicians for the new EEG apparatus at Osaka Army Hospital and the 141st General Hospital could not be solved by the requisition of trained personnel. Four electroencephalographic technicians, who proved capable of satisfactory work in their assignment at the Osaka Army Hospital and the 141st General Hospital, were trained by a short intensive course at the 361st Station Hospital.

TRUCE NEGOTIATIONS AND UNLIMITED OFFENSIVE ACTIONS 10 July to 1 October 1951

The beginning of the truce talks in July continued for several weeks. Soon it became apparent that optimism regarding an early end to the Korean fighting was not warranted. Offensive moves by the U. N. forces began later in July and were episodically renewed in August and September, when severe combat produced a large number of battle casualties. The U. N. attacks were aimed at improving our positions, particularly in the east central sector in order to obtain a shorter and more defensive battle line. Our efforts were largely successful, but the capture of stubbornly defended hill masses was a slow and painful process. Although patrol actions and limited engagements took place in the western area, the units in the east central zone, particularly the 2d Infantry Division, the 1st Marine Division, and, to a lesser extent, the 7th Infantry Division and 24th Infantry Division bore the brunt of the offensive combat.

Influence of Rotation

The psychiatric rate was only slightly elevated in response to the increased battle casualties. Perhaps the principal reason for the continued relatively low incidence of psychiatric breakdowns was the influence of rotation. For this reason adverse reaction from the pessimistic progress of the peace talks was minimal. Relief from combat had become an individual affair, obtainable by the person, regardless of the outcome of negotiations. Rotation became the chief topic of conversation among troops in Korea, for on it depended their hopes and dreams. As practiced, it was a new phenomenon for American combat forces. Although it is without doubt a step forward in preventive psychiatry and has proved its value, there are inevitable and

undesirable by-products. The most pertinent defect of rotation, aside from the logistical problems, is the disruption of the sustaining power of group identification that occurs when the soldier is notified or becomes aware that soon he will go home. Increase of tension follows. Such a "short termer" shifts his thoughts and feelings away from the group and often for the first time battle fear becomes unbearable because emotionally, at least, he becomes disengaged from his buddies and becomes concerned only about himself. The consequent rise of anxiety produces in some an inability to function. In most, tension noticeably increased in the last few days of combat, as if it were now dangerous to tempt fate. One can always hear stories, undoubtedly exaggerated, of the unlucky person who was killed the same day he was scheduled to leave on rotation. The other men of the group readily identify the "short termer" by the spontaneous actions of units in sending the rotatee to a rear, safe position or insuring his relief from patrol or other hazardous duties. The "short termer" often has mixed feelings about leaving because the ties to his buddies do not loosen so easily but it is rare for one to give up the rotation opportunity because such behavior would be regarded as queer or unusual by the group. Perhaps the most effective form of rotation would be the removal of entire combat units, or at least its older or original members. Such a method would be most difficult to accomplish from a logistical standpoint.

The 2d Infantry Division had taken a major share of the uphill offensive fighting. As a result, their psychiatrist was the busiest of the division psychiatrists. He collaborated with the Assistant Division Commander in establishing an intradivisional training program for replacements that was probably the most comprehensive effort of this type.

The periodic visits by the division psychiatrists to battalion aid stations strongly encouraged and influenced the battalion surgeon in the evaluation and treatment of combat exhaustion. More and more the first echelon of psychiatric treatment, particularly in secure tactical situations, was given in the battalion aid and collecting station.

The 121st Evacuation Hospital continued to serve as the principal psychiatric center of the Eighth Army throughout this period. The psychiatric service had developed excellent physical facilities, sufficient to care for 100 patients. The psychiatrist was supported by a psychiatric social worker, who took over much of the administrative detail, assisted in consultations, oriented new admissions, began group therapy sessions, and supervised the recreational program. An enlisted clinical psychologist joined the service in August and another psychiatrist was added in September. The gradual shift of Eighth Army Head-

quarters from Taegu to Seoul brought the neuropsychiatric staff in greater contact with the administrative and medicolegal problems that require psychiatric consultation.

Experiences in the use of psychiatrists at army level in Korea has consistently demonstrated the value of the psychiatric team. Such a professional team functions in an identical manner as a surgical team. The small group of trained personnel can be moved to any medical installation that is strategically located to receive casualties, be it a separate clearing company or an evacuation or field hospital. No doubt when there is continuous static warfare or a large production of psychiatric casualties, as in the ETO of World War II, a separate psychiatric unit may be preferable. But in the first year of the Korean campaign, with its many tactical reverses, difficult transportation problems, and dangerous rear areas, it was necessary to consolidate medical facilities and have alternate or reserve treatment facilities. The psychiatric team could begin functioning almost immediately in any unit that provided housekeeping facilities.

There was no essential change in the organization and operational procedures of psychiatric service in Japan during this period. The policy of the decentralization of psychiatric patients along with an emphasis on the outpatient and convalescent type of therapy for minor reactions was a well established development. Patients with major mental or neurologic disorders or diagnostic problems were hospitalized at 1 of 3 well-staffed neuropsychiatric centers, each equipped with closed-ward facilities, EST apparatus, and an EEG machine.

REFERENCES

(3) Kolansky, H., and Cole, R. K.: Field hospital neuropsychiatric service. U. S. Armed Forces M. J. 2: 1539-1545, Oct. 1951.

(4) Blacher, R.: Symposium on military medicine; convalescent hospital psychiatry. Supplemental Issue, Surgeon's Circular, FEC, Sept. 1951.

Anxiety is a relatively new concept in medicine. Despite the universality of subjective experience, only in recent decades has this major source of discomfort begun to receive some of the attention and study which it has most urgently warranted.

—HENRY P. LAUGHLIN, M. D.
in *Medical Annals of the District of Columbia*

CHRONIC DIARRHEA

A Clinical and Laboratory Study of 39 Cases

HENRY KRAUS, *First Lieutenant, MC, USAR*

DIARRHEA and dysenteric diseases comprise an important segment of the problems encountered in military medicine. This observation is emphasized by the fact that 10 percent of the 3,100 admissions to the medical service of this hospital during 1952 were for one of these diseases. Many had an acute self-limited disease of unknown cause and required only control of nutrition and fluid balance for effective treatment. A similarly large group of patients had chronic diarrhea. This latter group was more important from the standpoint of individual disability and the number of hospital days required for treatment and rehabilitation.

In view of the importance of chronic diarrhea as a disabling disease in terms of man-days lost from duty, it was worth while to determine the most common cause of it so that specific preventive measures and therapy could be practiced. It was recognized that the results and conclusions of this study would be applicable only to the peculiar environmental and sociologic circumstances surrounding troops stationed in Japan and Korea. Nevertheless, it was of general military interest and as such would stimulate further efforts toward the prevention of these diseases.

Materials and Methods

Thirty-nine U. N. soldiers consecutively admitted to the gastroenterology ward from September 1952 to March 1953 with a history of chronic diarrhea were studied. Patients who had four or more loose stools daily for at least one month were classified as having chronic diarrhea. The diarrhea was frequently associated with cramps, urgent bowel movements, and blood in the stools. In several instances the symptoms had been present intermittently for as long as eight years. Twenty-six of the patients were from the United States, four from France, two each from Belgium and Ethiopia, and one each from Puerto Rico, Colombia, Philippines, Greece, and Holland. Six regularly passed stool specimens from each patient were examined by concentration technics for the isolation of ova and parasites.

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Half of these specimens were sent to the 406th Medical General Laboratory, Tokyo, for examination. Each patient was then purged with magnesium sulfate and the resultant stool specimen was examined for ova and parasites and cultured for ameba and pathogenic bacteria. Similar cultures were made on two regularly passed stool specimens using SS and E. M. B. agars for bacteria and Boeck-Drbohlav and Nelson's alcohol extract media for ameba. Each patient was examined through a sigmoidoscope and multiple aspirations were taken from the walls of the rectum and lower sigmoid, particularly at the sites of existing lesions. These specimens were examined directly for ameba and cultured for bacteria and ameba. A sterile swab stick was inserted into the rectum of each individual and then cultured directly for bacteria.

Results

The results are indicated in table 1. The bacterial cultures for enteric pathogens were negative in all instances. *Endamoeba histolytica* trophozoites or cysts were found in 27 patients; 17 had cysts and trophozoites; 9 had only trophozoites; and 1 had only cysts. Two or more separate specimens were positive in 23 of the 27 patients, and in the other 4 patients only one specimen was positive. The diagnosis of amebiasis could have been made on a regularly passed stool in 16 patients and in a purged stool in 9 patients. In 7 other patients the stool specimens contained intestinal parasites other than *E. histolytica*. These included *Taenia saginata, Giardia lamblia, Trichuris trichiura, Endamoeba coli, Endolimax nana, Iodameba bütschlii, Strongyloides stercoralis,* and hookworm ova.

TABLE 1. *Diagnoses made in 39 patients with chronic diarrhea*

Diagnosis	Number
Amebiasis	27
Trophozoites and cysts	(17)
Trophozoites only	(9)
Cysts only	(1)
Other parasitic diseases	7
Chronic thrombotic ulcerative colitis	1
None	4
Total	39

On sigmoidoscopic examination mucosal abnormalities suggesting amebiasis were seen in 23 of the 27 patients in whom *E. histolytica* was isolated. In 4 of the 12 patients in whom no

ameba were observed, similar abnormalities of the intestinal mucosa were seen. These lesions consisted of yellow-brown, pinpoint, superficial abscesses of the intestinal wall, usually occurring in groups. When the contents of these lesions were aspirated, shallow ulcers appeared.

One patient with severe diarrhea had sigmoidoscopic and roentgenographic evidence of chronic thrombotic ulcerative colitis. No pathogenic organisms were isolated from him.

Discussion

The high incidence of amebiasis in this group of patients is hardly unexpected. While no accurate figures are available, it is the impression of many competent observers that chronic ulcerative colitis is a rare entity in the Army. Bacterial dysentery is probably not uncommon, but it is frequently adequately treated on an outpatient status and thus remains unrecognized by the early use of wide spectrum antibiotics. Such patients are rarely referred to the general hospitals. The important consideration in respect to the indiscriminate use of antibiotics for the treatment of diarrhea is the fact that many patients with amebiasis are unknowingly given ineffective doses of antibiotics. This diminishes the number of free ameba in the intestine, makes later diagnosis by stool examinations more difficult, and does not produce a satisfactory cure of the disease. These patients are referred to general hospitals when there is a recurrence of their signs and symptoms.

The high incidence of amebiasis in this series of patients can be explained by the fact that we were dealing with soldiers stationed in endemic areas and subject to the dangers of primitive indigenous sanitation. There was good evidence, however, that many of the patients acquired their infections prior to their service in this theater of operation. This was especially true in the French and Dutch soldiers who had acquired their infections elsewhere in Asia and in several American soldiers whose histories of diarrhea antedated their service in the Army.

Summary

Thirty-nine patients with a history of chronic diarrhea were studied by extensive parasitologic and bacteriologic technics to determine the various causative agents involved. *E. histolytica* was found in 69 percent. No bacterial pathogens were isolated. One patient had sigmoidoscopic and roentgenographic evidence of chronic thrombotic ulcerative colitis.

PENICILLIN-STREPTOMYCIN BONE BANK

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BANKS for the preservation of bone for homogenous grafts have been in use for more than 10 years. Inclan[1] first reported large-scale successful transplantation of homogenous and autogenous human bone which had been preserved by refrigeration. Bone preserved at low temperature is widely used[2,3] and a method of banking bone by immersion in merthiolate solution has been reported.[4] These procedures require rigid aseptic technic[5] and often special and expensive equipment such as quick-freeze units. Constant bacteriologic supervision is essential.

The report of the Committee for the Study of Preservation of Bone of the American Academy of Orthopedic Surgeons,[6] presented at its 1953 meeting, suggested that the peak of enthusiasm for banked bone may have passed, that it is declining, and the need for preservation of large quantities of bone is not as pressing as was formerly thought.

Bone banks are adapted to the needs of large institutions which have access to a sustained volume of human-donor bone. The use of heterogenous bone for grafting has not been practical. Although these "banking" methods have been successful, they are expensive and have other disadvantages. A simple, inexpensive method, which does not require special apparatus or highly trained personnel and is suitable for preserving small quantities of bone available to the average traumatic surgeon or orthopedist, has been developed by one of us (R. W. A.). We do not believe that this method has been reported previously.

We have preserved bone in a saline solution of penicillin-streptomycin in an ordinary household refrigerator. The penicillin-streptomycin bone bank has been used since 1947 in civilian and in military practice, and bone preserved by this method has been used in 100 patients. Bacteriologic studies of the early

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preserved grafts were uniformly negative; only occasional spot cultures have subsequently been done. There have been no infections associated with grafts from bone preserved by this method. We have been unable to detect any perceptible clinical or radiographic difference between the patients who received grafts from the penicillin-streptomycin bone bank and those in whom fresh autogenous bone was used. Because of limited sources of bone and the frequent need for grafts, all bone banked has been used within three months. Experience with bone preserved longer than this is lacking. Until further information regarding the intimate changes in banked bone is available we prefer to use our material within six to eight weeks of preservation.

The critical evaluation of a method of banking bone for grafting purposes depends on: (1) the incorporation and survival of the banked graft material within the body, and (2) a low infection rate. Secondary features of an acceptable method include simplicity and economy.

Effacement of a nonunion or the production of new bone depend largely on other factors such as aseptic necrosis rather than on the bone banking method. Reconstitution of transplanted bone is ordinarily judged by the roentgenographic pattern and by the clinical result such as restoration of continuity of the bone shaft. Transplanted bone may remain viable and yet not fulfill the purpose of the procedure for reasons unrelated to the banked bone or banking method. In a few patients, nonunions have persisted after use of bone preserved by the penicillin-streptomycin banking method due to unwise operative methods.

In a successful case, a transplanted bone graft will survive and unite to the host bone. Marked hypertrophy of transplanted bone occasionally occurs, but is rare. A transplanted graft that has not been adequately apposed to the bone of the host frequently fails to unite. To avoid this occurrence, we devised a bone-flaking apparatus to produce bone particles which fostered broad contact and union.[7] The value of transplanted homogenous bone is similar to fresh homogenous bone, but consolidation is slower.[2,3] Neither the method of preservation nor the degree of physical disintegration seem to be important.[8] Contact between the bone elements and vascularity of the host bone are required for consolidation of the graft.

A simple and practical means of preserving available bone is useful to orthopedic surgery. While there are several methods of preserving bone grafts and each has its own use, few meet the requirements of an individual surgeon who does not have need for a large quantity of bone or the facilities for freezing or dehydration, or the staff to operate a complex preservation procedure.

Our bone-banking method has been evaluated by criteria used in such procedures. We have established as a test for bone graft incorporation which is its roentgenographic appearance in comparison with normal bone, the successful completion of the operative mission, and the absence of infection. During the past three years in this hospital, our banking method for bone has been in constant and routine use. The most important aspect of this method of banking presented is the absence of infection associated with the use of such banked bone over a six-year period.

Bone most frequently used is from the middle third of the fibula. Loss of this area of bone apparently is not disabling. Complications of hematoma formation or infection at the donor site have not been troublesome.

Processing the Bone

The procedure of processing the bone for use is:

1. In a sterile bottle, about the size of the contemplated graft (fig. 1), 200,000 units of penicillin and one gram of streptomycin are placed and the bottle is then two-thirds filled with sterile saline.

Figure 1. Materials required to bank bone in a penicillin-streptomycin solution. The small bottle is a standard pharmaceutical pill bottle, available in several sizes.

2. The bone is secured, cleaned of soft tissue, and is immersed at once in the prepared bottle of penicillin-streptomycin solution.

Figure 2. Banked bone in refrigerator. Sponge in outer bottle eliminates breakage. Contents are visible and graft may be easily selected.

3. The bottle is then completely filled with saline solution so that when the stopper is in the bottle it can be inverted without an air bubble appearing.

4. The cap is screwed down securely and the bottle is inverted to check for leakage. Should leaks appear, a new bottle must be used.

5. The graft bottle is placed in a second larger sterile bottle which is then filled with zephiran (benzalkonium chloride) solution. (A sponge placed between the two bottles prevents breakage (fig. 2).)

6. The double bottle is covered and labeled to show the name of the donor, the date, and the source of the bone.

7. The bone graft is placed in the operating room refrigerator at about 50° F. (Temporary current failure can be disregarded.)

A protocol sheet showing the name of the donor, the date, the type of bone banked, and other pertinent details is filled out for each individual bone graft or banking procedure. Contamination of the bone should be avoided by minimizing handling and exposure to the air.

Preparation for using bone banked by this method follows:

1. The selected bone is removed from the refrigerator.

2. The inner bottle, containing the graft, is removed with forceps and immersed in a zephiran rinse basin.

3. After 10 minutes, the bottle may be removed, dried, and transferred to the instrument table where it is opened.

4. The bone is removed as needed with forceps.

5. Bone not used is placed in a fresh bottle with new penicillin-streptomycin solution and reprocessed for banking.

Summary

Preserving bone in a penicillin-streptomycin solution is simple, requires no special equipment or trained personnel, and is inexpensive. One hundred grafts have been done using bone so preserved. There have been no infections. All bone preserved by this method and used as a graft has integrated.

REFERENCES

1. Inclan, A.: Use of preserved bone graft in orthopaedic surgery. *J. Bone & Joint Surg.* 24: 81-96, Jan. 1942.

2. Bush, L. F.: Use of homogenous bone grafts; preliminary report on bone bank. *J. Bone & Joint Surg.* 29: 620-628, July 1947.

3. Wilson, P. D.: Experiences with bone bank. *Ann. Surg.* 126: 932-946, Dec. 1947.

4. Reynolds, F. C., and Oliver, D. R.: Clinical evaluation of merthiolate bone bank; preliminary report. *J. Bone & Joint Surg.* 31-A: 792-797, Oct. 1949.

5. Hyatt, G. W.: Fundamentals in use and preservation of homogenous bone. *U. S. Armed Forces M. J.* 1: 841-852, Aug. 1950.

6. Report of the Committee for the Study of Preservation of Bone. Presented at meeting of American Academy of Orthopedic Surgeons, Chicago, Ill, Jan. 21-30, 1953.

7. Augustine, R. W.; Landmesser, W. E., Jr.; MacAusland, W. R., Jr.; Shaffer, L. W., Jr.; and O'Brien, F. D.: Bone-flaking device. U. S. Armed Forces M. J. 4: 865-869, June 1953.

8. Rosenberg, N. J.: Technique of blender bone mill. Presented as exhibit at meeting of American Academy of Orthopedic Surgery, Jan. 1953.

TWO CLINICAL USES OF THE BENDER VISUAL-MOTOR GESTALT TEST

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IN using the Bender Visual-Motor Gestalt test in a military combat setting, two aspects of the test appeared to merit investigation: (1) Its usefulness in group testing, because of the necessity for quick assessment of a large number of patients; and (2) its usefulness in the detection of malingerers, prompted by the discrepancies between reported claims made for the test[1,2] and our observation of its effectiveness.

GROUP ADMINISTRATION OF THE BENDER-GESTALT TEST

In view of the comparative ease and rapidity with which the Bender-Gestalt test can be given to one person, its use for group testing would probably not be necessary in most clinical situations; but the peculiar problems of a neuropsychiatric hospital in a combat zone demand the speedy disposition of relatively large numbers of patients. Any time-saving procedure is of potential value.

The problem was to devise a method of group administration of the Bender-Gestalt test and to check the clinical usefulness of the drawings so obtained. It was assumed that if the drawings by the group method of testing were not significantly different from those obtained by individual testing, then the same interpretations could be applied to both.

Sixty-four Army neuropsychiatric hospital patients were divided into experimental group A and control group B, group A consisting of the first 32 patients consecutively admitted to the hospital and group B of the next 32 patients admitted. The number of patients selected was arbitrary and conformed to the limits of time and personnel available for carrying on the study. All patients were first tested individually and then, from four to six hours later, those in group A were given the test in a group and

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patients in group B were retested individually. In all tests, the standard instructions were given and the standard materials were used, except that for the group administration of the test, the designs were enlarged three times normal size on 10 5/8- by 15 1/2-inch, white, cardboard cards.

The test and retest papers, each of which bore a special code marking for later identification, were shuffled, those of group A being kept separate from those of group B. Two clinical psychologists, who had not participated in the administration of the tests and who did not know the code markings on the test papers, attempted to match the test paper with the retest of each patient. The psychologists were allowed to confer with each other in matching the test papers. The results of the matching are seen in table 1.

TABLE 1. *Results of matching the tests with the retests*

	Correctly matched	Incorrectly matched
Group A	28	4
Group B	32	0

All Bender-Gestalt test papers for both groups were also scored separately by the Pascal-Suttell system.[2]

Applying the significance of difference formula (X^2) with Yate's correction for continuity[3] to these data indicates that there is no significant difference in the success of matching the tests and retests for patients in group A and in the control group B.

The distribution of Pascal-Suttell scores for Group A is given in table 2 and for group B in table 3.

The Pearson product-moment correlation (r) calculated and the standard deviation (σ) for the test-retest scores of group A indicate r = .84, σr = .053 and for the test-retest scores of group B r = .65, σr = .102.

Both product-moment correlations differ significantly from zero. However, a check of the significance of the difference between the two correlations, using the formula $\sigma z_1 - z_2 = \sqrt{\frac{1}{N_{1-3}} + \frac{1}{N_{2-3}}}$ as outlined in McNemar[3] indicates that the difference between the two correlations is not significantly greater than chance expectancy (at the .05 level).

TABLE 2. *Distribution of test and retest scores of group A according to the Pascal-Suttell scores*

Pascal-Suttell score	Individual test frequency	Group test (retest) frequency
190-199		
180-189	1	1
170-179		1
160-169		
150-159		1
140-149	1	1
130-139	2	
120-129	1	4
110-119		1
100-109	4	3
90-99	2	2
80-89	2	7
70-79	7	6
60-69	4	5
50-59	5	
40-49	3	
	32	32

TABLE 3. *Distribution of test and retest scores of group B according to the Pascal-Suttell scores*

Pascal-Suttell score	Individual test frequency	Individual retest frequency
190-199	1	1
180-189		
170-179	1	1
160-169	1	1
150-159	1	2
140-149		
130-139		1
120-129		3
110-119		
100-109	3	1
90-99	11	2
80-89	12	10
70-79		2
60-69	1	4
50-59	1	2
40-49		2
	32	32

It has been shown that no significant difference occurs in the Bender-Gestalt test when comparing group testing with individual testing. This has been found by both a clinical matching procedure and using objective scoring criteria. The group administration of the test produced results similar to those obtained by the individual administration of the test. From this it can be concluded that group testing can be clinically administered and treated according to the principles of interpretation of the individually administered test and we can feasibly use the group method when the speedy disposition of large groups of patients is required. The interpersonal cues, so necessary for the evaluation of behavior, cannot be gained from the group administration of the test; nor can behavior variation in the drawings, such as card and paper rotation, be observed. Regardless of the graphic equivalence of the tests, their limitations are such that the group method can be used only in demand situations.

BENDER VISUAL MOTOR GESTALT TEST IN DETECTION OF MALINGERING

In her monograph on the Bender Visual-Motor Gestalt test[1] Bender suggested that attempts to consciously distort the reproduction of the figures, as in malingering, can be detected. She stated that the gestalt of the figures, for instance, will be apparent in spite of other graphic changes. Hutt[4] also indicated that malingering can be detected by the Bender-Gestalt test. He stated that the consciously distorted drawings will be small, inhibited, and uneven, and postulated that the Gestalt principles will remain on a high level, and that the symbols will be simplified. Using the Bender-Gestalt test in a military setting we have observed that so-called malingerers often produce records which cannot easily be differentiated from clinically ill mental patients.

Our problem was to test the hypothesis that malingerers cannot be differentiated from clinically ill psychiatric patients by using the Bender-Gestalt test. For the purposes of this study malingering is defined as a conscious attempt to appear mentally ill.

Two groups of people were tested. Group C consisted of the first 35 patients admitted consecutively to an Army combat neuropsychiatric center who had been diagnosed as mentally ill and included psychotic, neurotic, organic brain damage, and mentally deficient cases and had been given the necessary psychologic tests. Group D consisted of 35 enlisted men of an Army medical holding company, selected by taking every third man on the alphabetical roster. They were serving in various capacities in the maintenance of a combat neuropsychiatric center and had some observation of neuropsychiatric patients but none had

training in psychology. Upon entering the testing situation the men in group D were given the following instructions:

> "This is part of a research program to find out more about people who are trying to play 'psycho.' You've seen all kinds of patients here, some sick and some 'eight balls.' What we want you to do is to act like you are mentally ill when you take this test. The test itself consists of nine cards with designs on them. I want you to draw them as you think a mentally ill person would. This may sound strange, but it's very important that you draw them as you think a 'psycho' would. Here is a pencil; draw them on this paper."

The Bender drawings for group C were included in the routine tests and had been done with standard instruction.

TABLE 4. *Distribution of test scores for group C*

Pascal-Suttell score	Frequency
190-199	2
180-189	0
170-179	1
160-169	0
150-159	0
140-149	2
130-139	1
120-129	1
110-119	0
100-109	5
90-99	2
80-89	6
70-79	8
60-69	5
50-59	2
Mean = 95.49.	

The test data from groups C and D were scored according to the Pascal-Suttell system[2] (tables 4 and 5).

A test of the significance of the difference between the two means indicates that the difference cannot be considered statistically significant.

The test papers were subjected to a matching procedure similar to that of groups A and B except that the papers from groups C and D were mixed, shuffled, and presented to the two psychologists who attempted to place the papers that appeared to be the drawings of the clinically ill patients in one stack and those con-

sciously distorted in another stack. Forty-five test papers were correctly matched and 25 were incorrectly matched. It is found upon application of a test of significance for proportions that the sorting performance of the judges is significant at the .01 level. Both psychologists knew of the differential interpretation features suggested in the cited literature and both had had several years of experience using the Bender-Gestalt test.

Malingering could not be differentiated from a sample of diagnosed mentally ill patients by means of the Pascal-Suttell scores. Psychologists familiar with the Bender-Gestalt test are able to differentiate the drawings of the mentally ill patients from those of the malingerers significantly better than chance differentiation. We believe that in the hands of the experienced clinician this test may be employed to detect malingering even though such detection cannot be made by the use of quantitative

TABLE 5. *Distribution of test scores for group D*

Pascal-Suttell score	Frequency
190-199	3
180-189	1
170-179	3
160-169	1
150-159	1
140-149	2
130-139	3
120-129	0
110-119	2
100-109	3
90-99	7
80-89	2
70-79	3
60-69	0
50-59	3
40-49	1

Mean = 116.43.

measures. Because of the large number of judgment errors made, caution must be used. In spite of the statistical significance of the matching procedure, experienced clinicians made a number of errors in the detection of malingered records and several problems involved in the study limit the acceptance of these findings.

The conclusions rest on the assumption that the clinical malingerer can be equated with apparently adjusted persons who are told to attempt to act mentally ill for this test. The motivation of a maintenance company soldier in this situation cannot be assumed to be the same as that of the malingerer who is attemp-

ting to act ill for selfish reasons. Therefore whether or not their drawing performance is similar is undetermined. The inclusion of clinically ill persons functioning in a "normal" fashion in the maintenance unit and of "malingerers" having been diagnosed and included as clinically ill is a possibility. The small size of the sample groups may increase the likelihood of these difficulties to be uncompensated for even by the operational definitions employed in this study. The assumption is also made that malingerers are not mentally ill, or that they differ from persons with other forms of behavior disturbance. In the matching technic, the clinical competence of judges and the untested reliability of their ratings are additional variants.

A review of the protocols of group D showed some of the drawing features which served as differential signs in those records which were correctly matched. Those noticed are:

Substitution. One geometrical figure was substituted for another without losing the Gestalt or showing a decrease in drawing proficiency; for example, a circle was drawn instead of a diamond in the center of drawing No. 8.

Increased complexity. Well-controlled graphic elements were added to the figures; for example, extra symmetrical loops were placed on drawing No. 4.

Inconsistency. Difficult designs were well done even though simple ones had been distorted, and there was variability among them.

Symbolism. Figures were converted to simple symbols which did not correspond with the symbols often used by psychopathologic persons.

These are offered only as clinical observations which may be subjected to systematic investigation. They conform to those of Hutt[4] and Bender[1] only in regard to the uneveness of performance and the maintenance of the gestalt.

SUMMARY

This study employed the Pascal-Suttell scoring system and a pooled judgment technic in an attempt to differentiate between clinically ill neuropsychiatric patients and experimental subjects instructed to malinger on the Bender-Gestalt test. The Pascal-Suttell method did not demonstrate significant differences between the two groups. The clinicians were able to differentiate the productions of malingerers from those of mentally ill patients. The original null hypothesis of the study to the effect that malingerers could not be detected was rejected.

REFERENCES

1. Bender, L.: *Visual Motor Gestalt Test and Its Clinical Use.* American Orthopsychiatric Association, New York, N. Y.
2. Pascal, G. R., and Suttell, B. J.: *The Bender-Gestalt Test;* Quantification and Validity for Adults. Grune & Stratton, Inc., New York, N. Y., 1951.
3. McNemar, Q.: *Psychological Statistics.* John Wiley & Sons, Inc., New York, N. Y., 1949. p. 207.
4. Hutt, M.: A guide to the use of the Bender-Gestalt drawing. Medical Field Service School, Brooke Medical Center, Fort Sam Houston, Tex., SMNP 237, May 1947.

DOCTORS ON EVEREST

The climbing of Everest is a triumph already acclaimed wherever the victories of the human spirit are prized above those of the market place. The silent challenge of its peak has attracted eleven expeditions—not all intended to gain the summit—and sixteen lives have been lost in meeting it. If courage and resource are the qualities preeminently needed to explore those wastes of rock and snow, solutions to the physiological problems of living strenuously at high altitudes were no less necessary to the success that added a further touch of splendour to Coronation Day.

Medical men have contributed much to make these expeditions possible at all, both in helping to design suitable equipment and in accompanying, and sometimes leading, the climbing parties; they have also to carry out the essential but less spectacular duties of looking after the members of the expedition in the long approach to the mountain. The doctor in medical charge of the expedition, besides advising on camp hygiene, may have to deal with almost any medical or surgical emergency in one of the most remote parts of the world, from setting a broken limb to treating heatstroke or frostbite. His is the duty also—a familiar one to regimental medical officers during the war—of looking out for early signs of the mental disturbances that can have such serious consequences if allowed to develop and spread among strained and tired men. In giving advice on acclimatization the experience of a mountaineer-doctor is invaluable to the leader of the expedition. At Himalayan altitudes, and especially above 20,000 feet, the benefits of becoming acclimatized are apt to be offset by a deterioration in health whose cause is not clearly known. Individuals vary greatly in their response to these stresses, but after a time nearly everyone suffers a diminution of nervous control and a loss of weight which may be severe. There are in addition the hazards of a violently fluctuating temperature, which specially designed equipment can only partially mitigate. Bright sunlight by day may cause heavy sweating, to be followed by subzero temperatures at night, and perhaps even more difficult to overcome than the low oxygen tension is the dehydration that these altitudes cause.

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CROSS RESISTANCE OF BACTERIA TO ANTIBIOTICS

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THE increasing number of available antibiotics has not completely resolved the problem of bacterial resistance to them. In some instances, these newer drugs have served to complicate the immediate resistance problem by introducing the phenomenon of cross resistance of bacterial species to other antibiotics. Gocke and Finland[1] have recognized cross resistance as a possible clue to the clarification of the more fundamental explanation of the "resistance riddle of the bacterial universe." With the determination of the chemical structures of various antibiotics, metabolic studies of a more fruitful nature can be pursued. The explanation of the modes of action of particular antibiotics may give insight into methods of deterring or even reverting bacterial susceptibility to them.

Cross resistance to agents of a similar chemical nature is not entirely unexpected. Kirby and Rantz[2] in the sulfonamide era demonstrated cross resistance of *Escherichia coli* and the gonococci to various sulfonamides.

It is significant that most of the major antibiotics which are relatively nontoxic to man are derived from the genus streptomyces. Penicillin is obtained from the fungus penicillium, and bacitracin, polymyxin, and circulin are extracted from bacteria. Thus, a major group of our antibiotics are of the same generic heritage. The habitat of antibiotic producers is relatively similar and it is possible that individual survival of particular genera is dependent on the elaboration of specific metabolites or antimetabolites.

Permanency of Resistance

Experiments have shown that micro-organisms can be "trained" to grow in certain substrates with the loss or acquisition of specific properties. In this process it is assumed by some workers that alternate metabolic pathways are established within the organism together with a reorganization of the chemical processes.[3-5] These changes may be permanent or temporary.

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Extensive studies in many laboratories have demonstrated that penicillin-resistant staphylococci will lose this resistance when transferred in antibiotic-free medium.[6] Current studies with staphylococci which are resistant to aureomycin, terramycin (oxytetracycline), and/or chloramphenicol have not demonstrated this loss in resistance. Murray and co-workers[7] have shown that no loss occurred in streptomycin resistance after 100 serial transfers in antibiotic-free media. The change of micro-organisms from being sensitive to being resistant to aureomycin, terramycin, chloramphenicol, and streptomycin, whether chemically induced or by genetic selection, appears to be relatively permanent.

Our Studies

Our in vitro studies in attempts to demonstrate cross resistance between penicillin and the broad spectrum antibiotics, aureomycin, terramycin, and chloramphenicol, proved fruitless.[8] Yet, increasing numbers of micro-organisms that are resistant to all four of these agents are being isolated. A comparison of micro-organisms resistant to, with those sensitive to aureomycin, terramycin, and/or chloramphenicol showed that there were twice as many staphylococci resistant to penicillin in the resistant group as there were among those organisms which were sensitive to those broad-spectrum antibiotics. In these studies an indirect mechanism of cross resistance was suggested.[9]

Recently, preliminary resistance studies with erythromycin[10] on staphylococci have yielded some very interesting results. Resistance was induced in organisms of several different resistance patterns to various antibiotics. The results of two groups of these organisms were particularly worthy of note. When erythromycin resistance was induced in those organisms which, prior to erythromycin exposure, were resistant to broad spectrum antibiotics and sensitive to penicillin, they showed an increase in resistance to penicillin and erythromycin and no loss of the broad spectrum resistance. The control group of organisms which were sensitive to all the major antibiotics gave evidence of increased resistance to erythromycin only after exposure to erythromycin. When parent organisms which originally were penicillin resistant were transferred to increasing concentrations of erythromycin, they not only showed continued penicillin resistance but also increased resistance to erythromycin. Thus, in this series of experiments it appears that a one-way cross resistance can be established between penicillin and erythromycin if the organism originally is broad-spectrum resistant. More studies are in progress to elaborate these findings.[11]

Other Investigations

Evidence by other investigators has confirmed the occurrence of cross resistance between aureomycin and terramycin.[1, 6, 12-15] Most investigators believe that three-way cross resistance between aureomycin, chloramphenicol, and terramycin is unpredictable. Structurally there is a chemical similarity between aureomycin and terramycin[16, 17] which could be influencing this phenomenon. Chloramphenicol differs in configuration from the two foregoing antibiotics, but cross resistance relationships to these three antibiotics have been established in certain micro-organisms.[1, 6, 13] Strains of *Aerobacter aerogenes* tend to develop resistance and cross resistance to a greater degree in a shorter time than other genera.[6] Strain variation of cross-resistant behavior has also been noted by Pagano and co-workers[18] in studies with streptomycin and related antibiotics.

In genetic studies of microbial cross resistance of *E. coli* to antibiotics, Szybalski and Bryson[19] have demonstrated what they consider four groups of cross resistance:

1. Organisms resistant to streptothricin, viomycin, vinactin, cantenulin, and neomycin are also resistant to streptomycin, but the converse does not hold true.

2. Aureomycin, chloramphenicol, and terramycin are less closely related to penicillin and neotropin.

3. Organisms resistant to polymyxin and neotropsin show a one-way cross resistance to streptothricin, contenulin, neomycin, and streptomycin.

4. Bacitracin-resistant organisms showed no cross resistance to other antibiotics.

Haight and co-workers[20] have shown cross resistance, with certain limitations, in micro-organisms to neomycin and streptomycin. When an increase in resistance of bacteria to neomycin was demonstrated, significant increases in resistance to streptomycin also developed; the converse did not hold in all experiments. No cross resistance occurred between streptomycin or neomycin and penicillin, aureomycin, terramycin, chloramphenicol, bacitracin, or polymyxin B. Gezon and Fasan,[21] and Pagano and co-workers[18] confirmed the foregoing with respect to the variability of cross resistance to streptomycin and neomycin.

Recent investigations have shown that there is no direct cross-resistance relationship between carbomycin[22, 23] or erythromycin[24-26] and other major antibiotics. However, a cross resistance relationship does exist between carbomycin and erythromycin.[10, 27] Preliminary studies with these two agents gave promise for their use against penicillin-resistant micro-organ-

isms. However, this new problem of cross resistance could rule out the possibility of using carbomycin against erythromycin-resistant organisms or vice versa.

Application

The practical application and interpretation of the foregoing findings will continue to play a significant role in antibiotic therapy. No longer can the physician assume that in all cases a given bacterial infection will respond to a given antibiotic. His alternate choice of therapy must be guided by the information that resistance and cross-resistance studies have contributed. It is the responsibility of the laboratory to provide adequate information concerning resistance of the necessary infectious agents in the shortest time possible.

The study of the fundamental mechanisms involving bacterial resistance to antibiotics must be studied with increased vigor. The thousands of organisms which have been screened in the past decade with a yield of a relatively few desirable antibiotics makes the outlook for "super" antibiotics pessimistic. The combined efforts of geneticists, bacteriologists, biochemists, and physicists can best resolve the "resistance riddle of the bacterial universe" through more basic studies in bacterial metabolism.

Summary

The selection of alternative choices of therapy should be guided by the information contributed by cross resistance studies.

Aureomycin would probably not be selected as alternative to terramycin, or vice versa, in refractory conditions due to resistance. In some bacterial genera and species, organisms resistant to aureomycin and/or terramycin are also resistant to chloramphenicol. Organisms resistant to viomycin and neomycin may be resistant simultaneously to streptomycin. Carbomycin would probably prove ineffective against erythromycin-resistant organisms, or vice versa. Among organisms which were resistant to aureomycin and terramycin, exposure to erythromycin produced a resistance to penicillin in experimental studies.

With the problems of resistance and cross resistance so apparent, the in vitro antibiotic sensitivity test should be done on certain micro-organisms.

REFERENCES

1. Gocke, T. M., and Finland, M.: Cross-resistance to antibiotics; effect of repeated exposure of bacteria to aureomycin, terramycin, chloramphenicol or neomycin on resistance to all of these antibiotics and to streptomycin and penicillin. *J. Lab. & Clin. Med.* 38: 719-735, Nov. 1951.

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2. Kirby, W. M. M., and Rantz, L. A.: Quantitative studies on sulfonamide resistance. *J. Exper. Med.* 77: 29-39, Jan. 1943.

3. Umbreit, W. W., and Oginsky, E. L.: Mode of action of antibiotics: penicillin and streptomycin. *J. Mt. Sinai Hosp.* 19: 175-184, May-June 1952.

4. Long, P. H.: Mode of action of antibiotics. *New York J. Med.* 52: 1637-1639, Sept. 1952.

5. Tolstoouhov, A. V.: Physical-chemical approach to problems of chemotherapy. *Trans. New York Acad. Sc.* 14: 260-269, May 1952.

6. Miller, C. P., and Bohnhoff, M.: Development of bacterial resistance to chemotherapeutic agents. *Ann. Rev. Microbiol.* 4: 201-222, 1950.

7. Murray, R.; Wilcox, C.; and Finland, M.: Persistence of streptomycin resistance during subcultures in streptomycin free media. *Proc. Soc. Exper. Biol. & Med.* 66: 133-137, Oct. 1947.

8. Fusillo, M. H.; Romansky, M. J.; and Kuhns, D. M.: Further investigations on cross resistance as well as studies on induced sensitivity to antibiotics. *Antibiotics & Chemother.* 3: 35-40, Jan. 1953.

9. Fusillo, M. H.; Pulaski, E. J.; Reiss, E.; and Kuhns, D. M.: Staphylococcus aureus simultaneously resistant to penicillin and the broad spectrum antibiotics. In *Surgical Forum,* Proceedings of the Forum Sessions, Thirty-Eighth Clinical Congress of the American College of Surgeons, New York, N. Y., Sept. 1952. W. B. Saunders Co., Philadelphia, Pa., 1953. pp. 241-245.

10. Fusillo, M. H.; Noyes, H. E.; Pulaski, E. J.; and Tom, J. Y. S.: Antimicrobical spectrum acid cross resistance studies of erythromycin (ilotycin) and carbomycin (magnamycin). *Antibiotics & Chemother.* 3: 581, 1953.

11. Fusillo, M. H., and Pulaski, E. J.: Unpublished data.

12. Herrell, W. E.; Heilman, F. R.; and Wellman, W. E.: Some bacteriologic, pharmacologic, and clinical observations on terramycin. *Ann. New York Acad. Sc.* 53: 448-458, Sept. 15, 1950.

13. Pansy, F. E.; Khan, P.; Pagano, J. F.; and Donovick, R.: Relationship between aureomycin, chloramphenicol, and terramycin. *Proc. Soc. Exper. Biol. & Med.* 75: 618-620, Nov. 1950.

14. Fusillo, M. H., and Romansky, M. J.: Simultaneous increase in resistance of bacteria to aureomycin and terramycin upon exposure to either antibiotic. *Antibiotics & Chemother.* 1: 107-109, May 1951.

15. Kaipainen, W. J.: Does induced resistance of bacteria to one antibiotic result in simultaneous sensitivity changes to other antibiotic? *Ann. med. exper. et biol. Fenniae (Supplement)* 29: 1-96, Apr 1951.

16. Pepinsky, R., and Watanabe, T.: Isomorphism of terramycin and aureomycin hydrochlorides. *Science* 115: 541, May 16, 1952.

17. Stephen, C. R.; Conover, L. H.; Hochestein, F. A.; Regna, P. P.; Pilgrim, F. J.; Brunnings, K. J.; and Woodward, R. B.: Terramycin; structure of aureomycin and terramycin. *J. Am. Chem. Soc.* 74: 4976, 1952.

18. Pagano, J. F.; Weinstein, M. J.; and Donovick, R.: Cross-resistance studies with streptomycin, streptothricin, neomycin, and streptolin. *Proc. Soc. Exper. Biol. & Med.* 79: 359-363, Mar. 1952.

19. Szybalski, W., and Bryson, V.: Genetic studies on microbial cross resistance to toxic agents; cross resistance of *Escherichia coli* to 15 antibiotics. *J. Bact.* 64: 489, 1952.

20. Haight, T. H.; Wilcox, C.; and Finland, M.: Cross-resistance to antibiotics; effect of repeated exposures of bacteria to streptomycin or neomycin on the resistance to both of these and to six other antibiotics. *J. Lab. & Clin. Med.* 39: 637-648, Apr. 1952.

21. Gezon, H. M., and Fasan, D. M.: Cross resistance of streptococci to five streptomyces antibiotics. *Science* 114: 422-423, Oct. 19, 1951.

22. Tanner, F. W., Jr.; English, A. R.; Lees, T. M.; and Routien, J. B.: Some properties of magnamycin, a new antibiotic. *Antibiotics & Chemother.* 2: 441-443, Sept. 1952.

23. English, A. R.; Field, M. F.; Szendy, S. R.; Tagliani, N. J.; and Fitts, R. A.: Magnamycin: in vitro studies. *Antibiotics & Chemother.* 2: 678-688, Dec. 1952.

24. Haight, T. H., and Finland, M.: Laboratory and clinical studies on erythromycin. *New England J. Med.* 247: 227-232, Aug. 14, 1952.

25. Heilman, F. R.; Herrell, W. E.; Wellman, W. E.; and Geraci, J. E.: Some laboratory and clinical observations on new antibiotic, erythromycin (ilotycin). *Proc. Staff Meet., Mayo Clin.* 27: 285-304, July 16, 1952.

26. Maguire, J. M.; Bunch, R. L.; Anderson, R. C.; Boaz, H. E.; Flynn, E. H.; Powell, H. M.; and Smith, J. W.: Ilotycin, a new antibiotic. *Antibiotics & Chemother.* 2: 281-283, June 1952.

27. Finland, M.; Wilcox, C.; Wright, S. S.; and Purcell, E. M.: Cross resistance to antibiotics; effect of exposures of bacteria to carbomycin or erythromycin in vitro. *Proc. Soc. Exper. Biol. & Med.* 81: 725-729, Dec. 1952.

MILITARY DERMATOLOGISTS TO MEET IN CHICAGO 8 DEC.

The third annual meeting of the Association of Military Dermatologists will be held on 8 December 1953 at the Palmer House in Chicago under the presidency of Lieutenant Colonel William N. Piper, MC, USA, Walter Reed Army Hospital, Washington, D. C. One of the features of the meeting will be a round-table discussion of the military aspects of dermatology, conducted by several of the leading specialists in this field. The one-day session has been scheduled in conjunction with the yearly meeting of the American Academy of Dermatologists and Syphilologists.

The group, which includes 32 physicians of the Armed Forces and the U. S. Public Health Service, publishes the quarterly *Bulletin of the Association of Military Dermatologists*. Colonel Robert E. Lyons, USAF (MC), Lackland Air Force Base, Tex., is editor of this publication.

In addition to Colonel Piper, the officers of the association are: Captain Robert L. Gilman, MC, USN, honorary president; Captain William N. New, MC, USN, first vice president; Colonel Raymond M. Williams, MC, USA, second vice president; Walter Edmundson, M. D., USPHS, third vice president; Donald Birmingham, M. D., USPHS, fourth vice president; Captain Charles D. Bell, MC, USN, fifth vice president; and Lieutenant Colonel Carl K. Kaufman, USAF (MC), Parks Air Force Base, Calif., secretary-treasurer.

REACTIONS TO PENICILLIN GIVEN ORALLY IN MASS PROPHYLAXIS

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ALLERGIC reactions to penicillin have received wide publicity during the past decade.[1] Until recently this drug has been administered usually either parenterally or topically. Kitchen and Rein[2] have reported that the total penicillin reactions following intramuscular injections for syphilis at the New York University-Bellevue Medical Center for the years 1947, 1948, 1949, and 1950 were 4.65 percent, 3.74 percent, 3.42 percent, and 3.38 percent, respectively. Three types of reaction following intramuscular injections were observed: (1) an erythematous vesicular or desquamating eruption of the "epidermophytid-like" group, (2) simple urticarial reactions, and (3) delayed serum sickness-like reactions, either with or without urticaria. More recently, a few instances of a more severe type of anaphylactic-like shock syndrome[3, 4] have been described.

OTHER REPORTS

Topical use of penicillin[5] has been condemned by most American physicians because of the risk of local and systemic sensitization. In some American communications, hypersensitivity has been reported to occur in from 10 to 20 percent, but European investigators have observed only instances of hypersensitivity in less than one percent of patients. The experience of the writer with topical use of penicillin therapy in the military service, both in the United States and overseas has been more in accord with the European experience.

Little has been reported concerning the reactions following the use of penicillin orally. Babione and his associates[6] believe that penicillin reactions in the general public and in the U. S. Navy appear to be becoming more frequent and possibly more severe, but available records of persons receiving penicillin orally in the prophylaxis of venereal diseases reveal only 37 reactions in thousands of naval personnel who have used penicillin tablets orally in the past few years. The majority of these

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reactions were considered minor in nature. Little sensitivity from prolonged use of these tablets appears to be developing in the Navy. According to Keefer,[7] penicillin by mouth causes few or no disagreeable side reactions and the incidence of hypersensitivity is less than when it is given intramuscularly.

In January 1953, an oral penicillin prophylactic program was instituted on a mass scale in an overseas area of high venereal disease incidence. The purpose of this communication is to report the reactions which have been detected. Preliminary samplings of this large group of young men revealed that about 75 percent previously had received penicillin for miscellaneous ailments.

PROCEDURE

Penicillin tablets (Stock No. 1-606-799, Armed Services Catalog of Medical Materiel) were dispensed on a strictly voluntary basis by medical corpsmen at the main gates of two large military installations. Although esthetically objectionable and despite inadequate physical facilities for such dispensing, the program was favorably received by the men even without preliminary indoctrination or publicity. The dosage was 500,000 units of penicillin given in two tablets with a cup of water. The tablets were swallowed at once, and this was witnessed by the medical corpsmen. This program of dispensing penicillin to troops was continued for 45 days with an individual limit of three prophylactic treatments per week. During this period 11.8 billion units of penicillin were dispensed, and these tablets represented 23,544 separate treatments.

Experienced medical officers were invited to participate in this study and were requested specifically to screen all incoming dispensary patients for allergic reactions and to refer them directly to the writer for evaluation. Their complete co-operation was obtained.

FINDINGS

A painstaking investigation during the 45 days of penicillin administration and for four months after its cessation resulted in the detection of only 21 cases of allergic reactions believed to be due to the ingestion of the tablets. A significant number of men were known to have taken as many as 18 separate treatments of 500,000 units each during the 45 days. There were others known to have been repeaters but to a lesser extent.

The reactions were: (1) eight patients with simple urticaria; (2) six with serum sickness-like with urticaria; (3) three with erythematous and vesicular eruption; and (4) four with erythematous and urticarial, id-like eruption, localized in the palms. They represent an incidence of allergic reactions of less than 0.08 per-

cent per prophylactic treatment and comprise approximately 0.18 percent of all persons taking penicillin tablets.

All reactions were minor in comparison with the usual type seen following the administration of penicillin intramuscularly. Only one patient with generalized urticaria required relief from duty. No patients were hospitalized. Their treatment consisted of a bland lotion, observation, judicious neglect and, occasionally, an antihistamine drug. The majority of reactions cleared up completely in from two to three days. The serum sickness-like reactions with joint manifestations usually cleared in a week. The onset of the reaction varied from one hour after ingestion of tablets up to 10 days. Seventeen of the 21 patients stated they had been given penicillin intramuscularly previously. Eleven patients had a history of previous allergic reactions, nine from penicillin administered intramuscularly and two from the oral use of sulfadiazine. Two patients reinforced a minimal reaction by continuing to use penicillin tablets, but other than prolonging the duration of their eruption, little harm evolved.

SUMMARY

Only 21 reactions were encountered in a large group of young men following 23,544 separate prophylactic treatments, each of 500,000 units of penicillin by mouth. All reactions were relatively minor and none required hospitalization. In this study, penicillin by mouth produced practically no significant reactions, and it appears that this method of administration merits more extensive use.

REFERENCES

1. Kitchen, D. K.; Rein, C. R.; Thomas, E. W.; and Spoor, H. J.: Reactions to penicillin. *Am. J. Syph., Gonor. & Ven. Dis.* 35: 578-582, Nov. 1951.

2. Kitchen, D. K., and Rein, C. R.: Report to the American Academy of Dermatology and Syphilology, Chicago, Ill., Dec. 1950.

3. Mayer, P. S.; Mosko, M. M.; Schutz, P. J.; Osterman, F. A.; Steen, L. H.; and Baker, L. A.: Penicillin anaphylaxis. *J. A. M. A.* 151: 351-353, Jan. 31, 1953.

4. Christenson, W. N.; Hedrick, G. W.; and Schugmann, R. F.: Fatal anaphylactic reaction following penicillin injection. *U. S. Armed Forces M. J.* 4: 249-252, Feb. 1953.

5. Hagerman, G.: On topical treatment with penicillin and concomitant hypersensitivity reactions. *Acta dermat.-venereol.* 30: 259-285, 1950.

6. Babione, R. W.; Hedgecock, L. E.; and Ray, J. P.: Navy experience with oral use of penicillin as prophylaxis. *U. S. Armed Forces M. J.* 3: 973-990, July 1952.

7. Keefer, C. S.: Evaluation, antibiotic therapy. *Postgrad. Med.* 9: 101-105, Feb. 1951.

PREVENTION OF AIRSICKNESS DURING TRAINING FLIGHTS

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IT has been shown that a mixture of 0.33 mg. of scopolamine hydrobromide and 25 mg. of diphenhydramine hydrochloride (benadryl) affords good protection against airsickness with relatively few side effects.[1,2] The sedative action of this preparation, although less than that of most effective prophylactics, is none the less significant.[3] The addition of an analeptic could be expected to decrease this effect and might, therefore, prove a useful adjunct. Because the palliative action of motion sickness prophylactics is thought by many to depend in part on their soporific ability, it was first necessary to determine whether stimulation of the central nervous system produced less protection. With this in mind, dextro-amphetamine sulfate (dexedrine sulfate) was added to the benadryl-scopolamine hydrobromide preparation and compared with the unsupplemented mixture during routine training flights. 10-(2-diethylamino-1-propyl)phenothiazine (parsidol hydrochloride) and Schering formula No. 1667 were included in this series because preliminary testing against seasickness indicated a promising degree of protection.[4] Finally, Wyeth formula 46062* was combined with scopolamine hydrobromide to determine whether the known effectiveness[5] of the individual constituents could be retained at reduced dosage levels.

EXPERIMENTAL TESTS

Two separate tests are described in this article. In the first study, air navigation trainees were used as subjects during their regular training flights in T-29 aircraft (modified DC-3), as reported in a previous study.[1] The average age of this group was 25.4 years and, with few exceptions, all had had considerable flying experience. The following substances were prepared in identical capsules: (1) placebo; (2) 25 mg. of parsidol hydro-

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*This compound is a combination of two drugs, phenergan [N-dimethylamino-2-methylethyl) phenothiazine] and isophenergan [N-(dimethylamino-1-methylethyl) phenothiazine]—*Editor.*

chloride; (3) 25 mg. of benadryl with 0.35 mg. of scopolamine hydrobromide; and (4) 25 mg. of benadryl with 0.35 mg. of scopolamine hydrobromide and 5.0 mg. of dexedrine sulfate. One capsule was given at random to each of the subjects from 30 to 60 minutes before take-off. The flights ranged from 2 to 12 hours, the average being about 5 hours.

The second group consisted of male and female student officers and airmen flying as passengers in C-47 aircraft on routine training flights of simulated air evacuation missions. The average age of the officers was approximately 27 years, and of the airmen, 22 years. Originally, the flights were scheduled in the morning and the students attended classes in the afternoon. Because many of the subjects claimed it was difficult to keep awake during afternoon classes following a training flight, the flights were later scheduled during the afternoon hours. The flights were from one to two hours and most were made during relatively calm weather. Thirty percent of the passengers had no previous flight experience.

Questionnaires from both groups were completed immediately after landing. The incidence of nausea and vomiting is shown in table 1.

In view of the extensive flying experience of the navigation trainees, it is not surprising that the incidence of nausea and vomiting among them is rather low. None of the drugs gave protection against vomiting at the five percent confidence level although both the benadryl-scopolamine hydrobromide and the benadryl-scopolamine hydrobromide-dexedrine sulfate mixtures gave indications of a decreased vomiting rate. When the incidence of frank vomiting was added to that of severe nausea, both of these preparations afforded significant protection. This protection became even more obvious when all grades of nausea were combined and its total incidence was compared with those who received the placebo. Parsidol hydrochloride did not afford protection at a statistically significant level ($P = 0.13$), but the tendency in this direction suggests that a larger series might reveal a true prophylactic effect. The side effects were slight. The anhidrotic effect of the benadryl-scopolamine hydrobromide combination, with or without dexedrine sulfate, was evident by the decreased sweating reported and the increased incidence of dry mouth. The only other significant variation from the placebo group was the decreased incidence of fatigue with both benadryl-scopolamine preparations. This is probably a reflection of the lower rate of airsickness in these groups. The incidence of drowsiness was slightly lower in the dexedrine sulfate-supplemented group than in the other three groups, although not at a significant level.

TABLE 1. *Effectiveness of various drugs*

Drug	Dose (mg.)	Number of subjects	Mild nausea (percent)	Severe nausea (percent)	Vomiting (percent)	Total (percent)
Placebo	-	172	12.2	2.9	6.4	21.5
Parsidol hydrochloride	25.0	172	8.7	0.5	5.8	15.1
Benadryl Scopolamine hydrobromide	25.0 0.35	174	2.8	0.6	2.8	6.3*
Benadryl Scopolamine hydrobromide Dexedrine sulfate	25.0 0.35 5.0	179	4.4	0	3.4	7.8*
Placebo	-	183	14.2	1.1	2.2	17.5
Schering formula No. 1667	25.0	187	15.0	1.6	1.6	18.2
Wyeth formula No. 46062	25.0	190	9.5	1.6	0	11.1
Wyeth formula No. 46062 Scopolamine	15.0 0.35	174	8.0	0.6	3.5	12.1

*Significantly different from placebo $P = < 0.01$.

The incidence of nausea and vomiting among the second group of subjects was too low to permit detection of significant prophylaxis. In harmony with previous findings, Wyeth formula No. 46062 provided apparent protection, although not at a significant level ($P = 0.08$). A decreased dose of this compound combined with scopolamine hydrobromide also failed to give protection ($P = 0.15$).

DISCUSSION

Although neither the sedative character of the benadryl-scopolamine hydrobromide mixture nor its antagonism to dexedrine sulfate was apparent in the present study, both of these actions have been shown unequivocally by objective measurements.[3] It is important, however, to bear in mind that the action of dexedrine sulfate in increasing wakefulness is not necessarily an unmitigated advantage. Payne[6] recently has shown that dexedrine sulfate added to a benadryl-scopolamine hydrobromide mixture actually decreased the job performance of air navigation students. Because such a stimulation did not noticeably impair the capacity of the original preparation to prevent airsickness there is hope that a better protective mixture may be evolved.

SUMMARY

A mixture of 25 mg. of benadryl and 0.35 mg. of scopolamine hydrobromide gave good protection against motion sickness both with and without the addition of 5 mg. of dexedrine sulfate. No significant difference in prophylaxis between the two groups of subjects were detected. The following preparations failed to afford significant protection: parsidol hydrochloride (25 mg.), Wyeth formula No. 46062 (25 mg.), Schering formula No. 1667, and Wyeth formula No. 46062 (15 mg.) plus scopolamine hydrobromide (0.35 mg.). The side effects were slight. The significance of adding an analeptic drug to combat the sedative effects of motion sickness preventives is discussed.

REFERENCES

1. Chinn, H. I.; Strickland, B. A., Jr.; Waltrip, O. H.; and Gainer, S. H.: Prevention of air sickness by benadryl-scopolamine mixtures. *U. S. Armed Forces M. J.* 2: 401-404, Mar. 1951.

2. Chinn, H. I.; Waltrip, O. H.; and Massengale, H. W.: Further studies on effectiveness of various drugs against airsickness. *J. Aviation Med.* 22: 535-539, Dec. 1951.

3. Noell, W., and Chinn, H. I.: Unpublished data.

4. Chinn, H. I.; Handford, S. W.; Smith, P. K.; Cone, T. E.; Redmond, R. F.; Maloney, J. V.; and Smythe, C. M.: Evaluation of some drugs in seasickness. *J. Pharmacol. & Exper. Therap.* 108: 69-79, 1953.

5. Chinn, H. I.; Gammon, W. R.; and Frantz, M. E.: Prevention of airsickness among airborne troops. *J. Appl. Physiol.* 5: 599-602, Apr. 1953.

6. Payne, R. B.: Efficacy of certain motion sickness drugs upon navigator proficiency. Air Force School of Aviation Medicine, Project No. 21-1601-0004, Report No. 1. In press.

A HYPERTENSION AND DIABETES DETECTION PROGRAM

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THE early detection of disease is the essential first step in preserving the worker's physical capacity so that his experience and skills can be retained by industry. Our aging population is faced with the threat of chronic degenerative disease, which often is insidious in onset, mild and even relatively asymptomatic in actuality, but tremendously costly in man-hour loss and in impairment of working efficiency. Such diseases as diabetes mellitus and hypertension fall into this category.

It has been pointed out that there are many diabetics who go undetected year after year.[1-6] These, if discovered, probably would be most amenable to treatment, the majority being mild, symptomless cases and those of recent onset.

Diabetes or hypertension may go unrecognized until some major catastrophe, such as loss of vision from diabetic[7] and/or hypertensive retinopathy,[8] beginning gangrene of a foot, a cerebral vascular accident, or a coronary thrombosis, occurs.[8, 9] The fact that vascular complications of diabetes are increasing, especially in the older age groups, is quite evident from the literature.[7-14]

The unfortunate part of the situation is that these degenerative diseases are progressive once they are well established, in spite of the best therapy and most vigorous management possible.[7] Our hope is to find these diseases in their incipiency before they cause symptoms or become associated with degenerations of the vascular tree and then to treat the patients with the best of medical armamentaria. Of course, in industrial medicine this latter objective of vigorous therapy is left to the employee and his physician of choice. Our main objective in public health remains to seek out these diseases, bring them to the attention of the worker, and encourage him to seek proper medical care.

From U. S. Naval Shipyard Dispensary, Philadelphia, Pa.

DETECTION PROCEDURES

It has been an annual procedure to make roentgenograms of the chest of all civilian workers in the shipyard. More than 12,000 have been examined so far this year. Heretofore this was the only mass survey for the detection of disease conducted by the dispensary among the civilian personnel, but because hypertension and diabetes lend themselves readily to mass survey technics, these have now been added to the preventive medicine program. Checkups for hypertension and diabetes were given to 5,250 workers.

The following procedure is being employed. We arbitrarily selected the group age 50 and over to begin the survey, so that our facilities would not be overtaxed, but have since included all those of age 40 and over. The entire civilian personnel eventually is to be included in the study, which will be a continuing one from year to year.

Each worker has a chest roentgenogram (70 mm. photomicrograph) and if he is in the age group 40 or over his blood pressure is taken, using a mercury sphygmomanometer. A urine specimen is then collected. The entire procedure of roentgenography, blood pressure determination, and collection of urine takes about 15 minutes.

The qualitative Benedict test for glycosuria[15] used to be performed on the urine specimen, but we have replaced this with the "clinitest" type[16] in order to speed up the procedure. The number of urinalyses performed daily for this survey has been about 200.

CASE FOLLOW-UP

Workers with a systolic blood pressure recording of 150 mm. Hg or higher or a diastolic pressure of 90 mm. Hg or higher are recalled to the dispensary for an interview. There is no universal agreement as to the dividing line between normal and high blood pressure, but most authorities refer to a diastolic pressure above 90 mm. Hg as hypertension and, as a rule, the systolic blood pressure is considered elevated when above 140 mm. Hg.[17] According to these criteria, 12 percent of the workers examined exhibited hypertensive readings. This is in agreement with the incidence of hypertension in the general population which is reported to be from 2 to 25 percent.[18]

The interviewing of the worker considered to be hypertensive is arranged at a time convenient for us and suitable for the particular shop in question. He is told that his blood pressure was found to be elevated, and rechecks are made if indicated. Answers to questions about his condition are made a part of his clinical record (chart A). If the blood pressure is very high (200

CHART A. *Hypertension detection drive—civilian workers, age 50 and over, U. S. Naval Shipyard, Philadelphia, Pa.*

Date	Name	Badge	Shop	Age	Known hyper-tension	Blood pressure	Physician	Symptoms	Signs	Family history	Follow-up
2/2/53	J. C.	No.--------	---	62	Yes	190/100	None	Occipital headaches; dizziness	None	Negative	To check with his local physician

mm. Hg or over, systolic; 110 mm. Hg or over, diastolic) he is given a heart examination, which in selected cases includes an electrocardiogram and a urine albumin test.

An effort is made to change his job status if it is deemed advisable. The worker is told to see his physician and to present evidence that he is actually under treatment (*i. e.*, a note from his private physician). About half of the hypertensive workers had not realized that they had an elevated blood pressure, and almost half of the group who were unaware of it had not seen a family physician in six months. By contrast, only about five percent of those who knew that they had hypertension were without a family physician.

Although 80 percent of the hypertensives declared that they had no symptoms of any kind, it is our impression that this figure is high because of their reluctance to admit their symptoms for fear of losing or changing their job status. The 20 percent who did admit symptoms had those commonly encountered in hypertensives. The data collected on hypertensives is tabulated in chart B. The highest blood pressure recorded was 248/138. The record of positive family history for hypertension appears somewhat low (10 percent), considering that there is suggestive evidence of a familial tendency to hypertension.[19-21]

As concerns detection of diabetes, a repeat urinalysis is done routinely for all cases of glycosuria and the worker is interviewed. Questions are asked concerning age, symptoms of diabetes, whether he knew that he had glycosuria, whether he is under a physician's care, and whether there was diabetes in the family. He is examined for signs of diabetes, including examination of the lower extremities for peripheral vascular disease. This is recorded (chart C) and notes are made in his clinical chart. A blood sugar sample taken two hours after a test meal (chart D)[7] is then examined by our laboratory and the results are given to the patient with instructions to see his physician. Diabetic patients are requested to have their own physician fill out the Diabetes Medical Report of the U. S. Civil Service Commission (Form 3684, June 1945), which becomes part of the case record.

Of the 99 interviews made in those men with glycosuria, 49 have been considered either diabetic or potential diabetics.[22] These latter patients were those with blood sugar levels between 150 and 170 mg. percent after a test meal and with a family history of diabetes or signs and symptoms of the disease. Chart E reveals that of 30 newly discovered diabetics, nine had no symptoms and might have gone undetected for some time. The majority of the known diabetics apparently were under satisfactory control.

CHART B. *Results of recheck for hypertension*

Age group: 40 to 69 Blood pressure range: 150/90 to 248/138

	Number interviewed	Number under physician's care	No physician at present	Number without symptoms	Number with symptoms										Positive family history for hypertension
					Dizziness	Headaches	Blurred vision	Urinary frequency	Short of breath	Tinnitus aurium	CVA*	Epistaxis	Marked obesity	Angina pectoris	
Known hypertensives	265	252	13	202	20	28	0	0	2	2	1	10	3	1	42
Unknown hypertensives	365	164	201	317	14	22	2	2	0	0	0	3	1	0	21
Total	630	416	214	519	34	50	2	2	2	2	1	13	4	1	63

*Cerebrovascular accident.

CHART C. *Diabetes detection drive—civilian workers, age 50 and over, U. S. Naval Shipyard, Philadelphia, Pa.*

Date	Name	Badge	Shop	Age	Known diabetes	Physician	Symptoms	Signs	Family history	Urine	Follow-up
1/26/53	A. E. H.	No.-----	---	65	No	Dr.---------	Polydipsia; polyphagia; nocturia, two to three times.	Lost 15 lb. in past year. Peripheral pulses palpable.	Negative	Sugar 4+	Repeat urinalysis, 4+. Blood sugar (two hours) = 196 mg. percent. Local physician, private patient on diet and insulin.

CHART D. *Test breakfast*

Weight (grams)	Food	Household measure	Protein	Fat	Carbohydrate
200	Orange juice	1 glass	2.	0	21.6
18	Cornflakes	½ cup	2.	0	18.
60	20 percent cream	¼ cup	2.	12.	2.
10	Sugar	2 tsp.	0	0	10.
30	Bacon	3 strips	6.	18.	0
100	Eggs (scrambled)	2	12.	12.	0
24	Butter	2 pats	0	20.	0
60	Bread	2 slices	7.	0	31.
	Coffee	1 cup	0	0	0
10	Sugar	2 tsp.	0	0	10.
			31.	62.	92.6

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CHART E. *Results of recheck for diabetes*

	Number interviewed	With symptoms ("polys," weight loss, pruritus, etc.)	Without symptoms	Blood sugar range (two hours) in mg. percent	On insulin therapy	Positive family history
Known to be diabetic before survey	19	6	13	160 to 303	6	5
Unknown to be diabetic and considered diabetic as result of survey	30	21	9	165 to 476	--	4
Exhibiting glycosuria, without diabetes	50	12	38	67 to 123	--	1
Total	99	39	60		6	10

All the diabetics encountered, both the known and the newly discovered, were re-evaluated as to job hazards, and those taking insulin have been disqualified for any job except ground work. A family history for diabetes was found in only 10 percent. This is low, considering that it has been estimated that perhaps 35 to 50 percent of diabetes is familial.[20] Whereas in the general population glycosuria has been found in from one to three percent,[1,6] we have found glycosuria in six percent and diabetes in three percent of the total number of men examined.

We believe that much can be done, by guiding these diabetic and hypertensive patients in seeking proper medical care, to keep them physically fit and to prolong their life expectancy.

SUMMARY

A hypertension and diabetes detection program at the U. S. Naval Shipyard, Naval Base, Philadelphia, Pa. includes a detailed plan for examinations, interviewing, and disposition of cases. Checkups for detection of hypertension and diabetes were given to 5,250 shipyard workers. Hypertension was found in 12 percent and diabetes mellitus in 3 percent of the workers examined.

REFERENCES

1. Wilkerson, H. L. C., and Krall, L. P.: Diabetes in New England town; study of 3,516 persons in Oxford, Mass. *J.A.M.A.* 135: 209-216, Sept. 27, 1947.

2. Blotner, H.: Studies in glycosuria and diabetes mellitus in selectees. *J.A.M.A.* 131: 1109-1114, Aug. 3, 1946; correction 131: 1449, Aug. 24, 1946.

3. Gate, E. W.: Diagnosis of undetected diabetes; report of study of group of 1,800 individuals. *Indust. Med.* 11: 387-391, Aug. 1942.

4. Marks, H. H.: Statistics of diabetes. *New England J. Med.* 235: 289-294, Aug. 29, 1946.

5. Marks, H. H.: Recent statistics on diabetes and diabetics. *M. Clin. North America* 31: 369-386, Mar. 1947.

6. Joslin, E. P.: Diabetes. (Medical Progress section) *New England J. Med.* 238: 401-407, Mar. 18, 1948; 437-443, Mar. 25, 1948; 471-476, Apr. 1, 1948.

7. Sindoni, A., Jr.: Fasting blood sugar vs. postprandial blood sugar as observed in normal individuals, medical (non-diabetic) patients, and patients with diabetes. Special references to: plain, protamine zinc and globin insulins, compatible hyperglycemia and arteriosclerosis. *Am. J. Digest. Dis.* 13: 178-192, June 1946.

8. Friedman, G.: Cardiovascular status of diabetic patients after fourth decade of life. *Arch. Int. Med.* 55: 371-394, Mar. 1935.

9. Root, H. F.; Bland, E. F.; Gordon, W. H.; and White, P. D.: Coronary atherosclerosis in diabetes mellitus; postmortem study. *J.A.M.A.* 113: 27-30, July 1, 1939.

10. Nathanson, M. H.: Coronary disease in 100 autopsied diabetics. *Am. J. M. Sc.* 183: 495-502, Apr. 1932.

11. Proceedings of the New York Diabetes Association, Feb. 1944. *Am. J. Digest. Dis.* 11: 345, Nov. 1944.

12. Barach, J. H.: Normal standards in treatment of young diabetics. *Am. J. Digest. Dis.* 11: 350-355, Nov. 1944.

13. O'Brien, C. S., and Allen, J. H.: Ocular changes in young diabetic patients. *J.A.M.A.* 120: 190-192, Sept. 19, 1942.

14. Lisa, J. R.; Magiday, M.; Galloway, I.; and Hart, J. F.: Arteriosclerosis with diabetes mellitus; study of pathologic findings in 193 diabetic and 2,250 non-diabetic patients. *J.A.M.A.* 120: 192-195, Sept. 19, 1942; correction 120: 384, Oct. 3, 1942.

15. Benedict, S. R.: Detection and estimation of glucose in urine. *J.A.M.A.* 57: 1193, Oct. 7, 1911.

16. Kasper, J. A., and Jeffrey, L. A.: Simplified Benedict test for glycosuria. (Tech. section) *Am. J. Clin. Path.* 8: 117-121, Nov. 1944.

17. Friedberg, C. K.: *Diseases of the Heart.* W. B. Saunders Co., Philadelphia, Pa., 1949.

18. Master, A. M.; Marks, H. H.; and Dack, S.: Hypertension in people over 40. *J.A.M.A.* 121: 1251-1256, Apr. 17, 1943.

19. Ayman, D.: Heredity in arteriolar (essential) hypertension; clinical study of blood pressure of 1,524 members of 277 families. *Arch. Int. Med.* 53: 792-802, May 1934.

20. Hines, E. A., Jr.: Hereditary factor in essential hypertension. *Ann. Int. Med.* 11: 593-601, Oct. 1937.

21. Platt, R.: Heredity in hypertension. *Quart. J. Med.* 16: 111-133, July 1947.

22. Sindoni, A., Jr.; Gerber, P.; Bove, F.; and Zibold, L.: Compatible hyperglycemia. *Am. J. Digest. Dis.* 20: 157-178, June 1953.

Emotions and Skin Diseases

Commonly encountered emotions such as insecurity, anxiety, hostility, and guilt may cause stimulation of the autonomic nervous system, leading to flushing, sweating, itching, and excoriation. Physical agents through which emotions mediate these effects are acetylcholine released at parasympathetic nerve fiber endings; sympathin produced by sympathetic stimulation; synergism between acetylcholine and histamine; and the mechanical and allergic effects of sweat retained under pressure.

Several skin disorders believed to be of emotional origin exhibit fairly characteristic personality patterns. An effort has been made to relate the clinical entity to the emotional pattern in herpes simplex, rosacea, urticaria, childhood eczema, adult neurodermatitis, and localized neurodermatitis. In most such cases it is desirable that one physician supervise both the somatic and psychic aspects of therapy. Functional dermatoses such as delutions of parasitosis, syphilophobia, dermatitis factitia, and neurotic excoriations result from deep-seated neuroses or psychoses and should be referred to the psychiatrist for treatment.

—GERALD M. FRUMESS, M. D.
in the *Journal of the American Medical Association*

Regular Medical Corps Officers Certified by Specialty Boards

The American Board of Otolaryngology

Activated in 1924, the American Board of Otolaryngology is the third largest of the specialty boards, being surpassed only by those of internal medicine and surgery. According to information received from the Offices of the Surgeons General of the three military departments, the following 55 regular officers have been certified in this specialty:

John E. Alexander, *Lt. Col., USAF*
Wallace E. Allen, *Comdr., USN*
William F. Andrew, *Maj., USA*

Alexander H. Beaton, *Capt., USA*
Paul F. Brookshire, Jr., *Maj., USA*
Clarence J. Brown, *Rear Adm., USN*
Henry G. Bullwinkel, *Capt., USN*

Glenn S. Campbell, *Capt., USN*
Paul A. Campbell, *Col., USAF*
Samuel L. Cooke, *Col., USA*

Jefferson Davis, *Comdr., USN*
Adrian J. Delaney, *Capt., USN*
Robert E. Douglas, *Comdr., USN*

Vernon J. Erkenbeck, *Col., USA*

Felix C. Feamster, *Lt., Col., USA*
Shirley A. Fuhring, *Comdr., USN*

Richard A. Gaillard, *Comdr., USN*

Fred Harbert, *Capt., USN*
Frederick L. Harcourt, *Maj., USA*
Theodore L. Hartridge, *Lt. Col., USA*
Derrick A. Hoxie, *Capt., USN*

Lewis G. Jordan, *Capt., USN*

Leroy L. Kenney, *Comdr., USN*
Norman E. King, *Lt. Col., USA*
Ralph N. Kraus, *Lt. Col., USAF*

Watson B. Larkin, *Comdr., USN*
Bruce V. Leamer, *Capt., USN*
James E. Lett, *Lt. Col., USAF*

Donald G. MacKinnon, *Comdr., USN*
Byron G. McKibben, *Col., USA*
Oscar P. Moffitt, *Lt. Col., USA*
Eugene H. Moyle, *Capt., USN*
Henry S. Murphey, *Col., USA*

Edgar L. Olson, *Col., USAF*
John Q. Owsley, *Rear Adm., USN*

Frank A. Perri, *Lt.,Col., USAF*

Robert P. Rea, *Col., USA*
John B. Reddy, *Lt. Comdr., USN*
Francis W. Regnier, *Col., USA*

Frank J. Shaffer, *Col., USA*
Kenneth Somers, *Lt. Col., USA*
Franklin L. Spann, *Lt. Col., USA*
Leslie O. Stone, *Rear Adm., USN*
Clifford A. Swanson, *Rear Adm., USN*

Hyman Turner, *Maj., USA*
Norman A. Twigger, *Maj., USAF*

Anthony J. Vadala, *Col., USA*

Wendell A. Weller, *Col., USA*
Edward J. Whiteley, *Lt. Col., USA*
Leroy E. Wible, *Comdr., USN*
Otto W. Wickstrom, *Capt., USN*
Mortimer L. Williams, *Capt., USA*
Edgar D. Wippermann, *Maj., USAF*

Jack O. Yeager, *Lt. Col., USA*
Clifton A. Young, *Capt., USN*

This is the second of a series. The names of officers certified in obstetrics and gynecology will be published in the December issue.

VERTICAL TRACTION IN OPEN FRACTURES OF THE FEMUR

HOWELL E. WIGGINS, *Commander, MC, USN*

OPEN fractures of the femur present a problem in operative management and in providing traction, because the usual position of the extremity on an operating or special orthopedic table does not provide circumferential access to the thigh. The so-called "90-90-90" vertical traction was devised by Obletz[1] as an aid in management and as a temporary method of traction.

Essentially, the method consisted of exerting suspension traction on the femur while the hip, knee, and ankle were flexed to 90 degrees. In addition to the obvious advantage of permitting ready access to the wounds, there are other less obvious advantages. Alinement of the fragments is obtained readily and without difficulty. This is particularly noticeable in fractures of the proximal and distal thirds of the femur, where flexion, abduction, and external rotation of the proximal fragment in the former, and flexion of the distal fragment in the latter, make these the most difficult of all femoral fractures to treat by traction, utilizing conventional methods. In addition, compression dressings may be applied without the possibility of disturbance of alinement, portable roentgenograms may be taken in both planes without the presence of radiopaque splints and bars on the film, nursing care is greatly simplified by the absence of the perineal ring, the patient is comfortable, and there is no necessity for constant observation on the part of the nursing staff to prevent maladjustment of traction and alinement.

CLINICAL TRIALS

Although Obletz made no mention of the use of vertical traction in the treatment of bilateral femoral fractures, the method appeared to be an ideal one for the handling of this complicated injury. The multitude of splints, attachments, pulleys, and weights necessary to provide balanced traction in these cases makes nursing care difficult. Between 1947 and 1949, two patients with bilateral fractures of the femur were treated by vertical traction and the results were so gratifying that this method was adopted to the exclusion of all others when traction was required in this type of injury. These patients were suspended in vertical

From U. S. Naval Hospital, Philadelphia, Pa.

traction for a period of 8 and 9 weeks, respectively. Beginning at the fourth week, both patients were given passive knee exercises, and at the sixth week were allowed to exercise their knees actively through the range of motion permitted by the apparatus. When the femurs were demonstrated to be clinically "sticky" and there was roentgenographic evidence of callus formation, a gradual diminution of hip flexion was begun with concomitant extension of the knee. This may be accomplished by moving the traction pulley distally in conjunction with lowering the calf sling, or by a shift to the Thomas splint with Pearson attachment.

This experience prompted our use of the vertical traction method as the major traction method in a series of 21 open fractures of the femur. In none of these patients were the complications mentioned by Obletz encountered, viz, stretching of the quadriceps tendon or patellar ligament, contracture of the hamstrings, or fixation of the patella. The only complication that was observed was the development in one patient of an abscess on the lateral aspect of the thigh near the greater trochanter. This was undoubtedly due to dependent drainage from the site of compounding. The abscess required drainage, following which all local symptoms promptly subsided. It should be pointed out, however, that this same complication may occur in conventional traction, where the thigh is invariably maintained in a flexed position. It is also my impression that fractures of the femur treated by vertical traction require a little longer to exhibit roentgenologic evidence of adequate callus formation than those treated with conventional traction although with my limited experience with the method I cannot confirm or deny the impression.

REPORT OF A CASE

A 20-year-old man was admitted with an open comminuted fracture of the right femur at the junction of the proximal and middle thirds, the injury having been sustained during enemy action 2½ weeks prior to admission. The anteroposterior and lateral roentgenograms of the right femur in plaster on his admission to this hospital are reproduced in figures 1A and 1B. The cast was removed and the patient placed in 90-90-90 traction. Figures 2A and 2B are anteroposterior and lateral views, respectively, of the fracture, two weeks later. Figure 3 illustrates the technic of traction and the position of the extremity. Conversion to a Thomas splint with Pearson attachment and gradual extension of the knee was begun during the eighth week in 90-90-90 traction. Six months after the injury there was clinical and roentgenographic evidence that the extremity was sufficiently stable to allow ambulation in an ischial weight-bearing caliper brace. The patient was returned to a limited duty status about 11 months after the original injury.

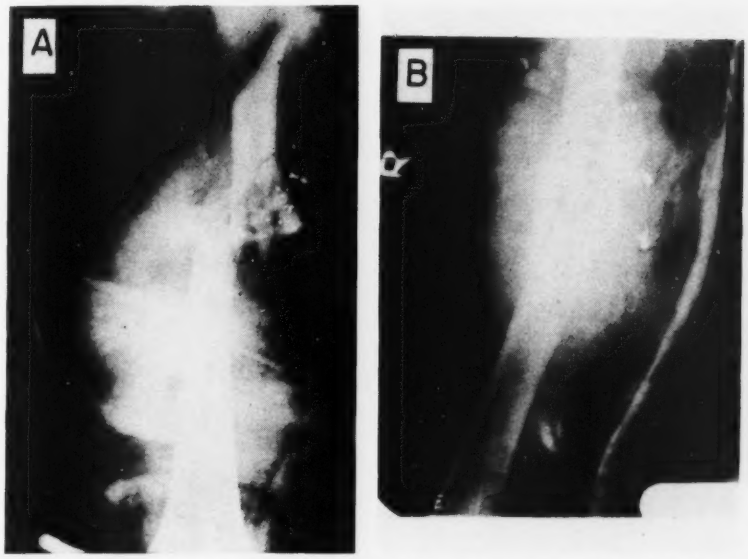

Figure 1. (A) *Anteroposterior and* (B) *lateral roentgenograms of the right femur in plaster on admission to our hospital.*

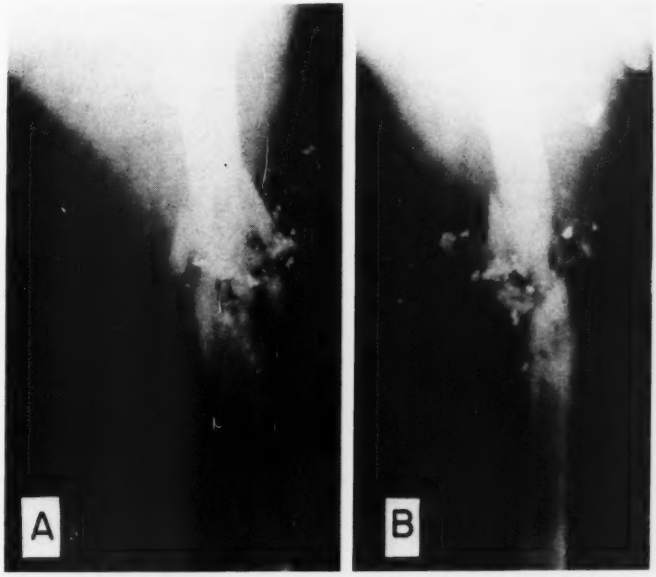

Figure 2. (A) *Anteroposterior and* (B) *lateral roentgenograms of the right femur two weeks after suspension in vertical traction.*

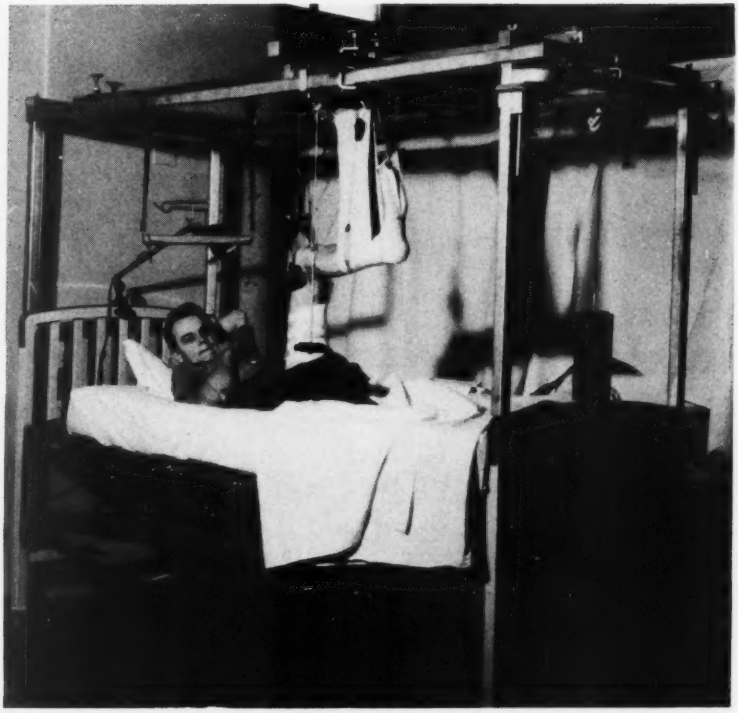

Figure 3. The technic of 90-90-90 traction and positioning of the extremity.

CONCLUSIONS

Vertical traction offers advantages in the management of difficult femoral fractures, without producing serious complications. Its use is suggested in selected cases.

REFERENCE

1. Obletz, B. E.: Vertical traction in early management of certain compound fractures of femur. *J. Bone & Joint Surg.* 28: 113-116, Jan. 1946.

OSTEOARTHROPATHY AND SIMPLE CLUBBING

JOHN T. LOGUE, *Captain, USAF (MC)*

ONE case of chronic idiopathic hypertrophic osteoarthropathy and two other cases of simple clubbing of the fingers and toes in brothers have been observed during the past year. These patients are of interest because they are otherwise healthy servicemen who became aware of their condition only because of the gradual appearance of marked clubbing of the fingers and toes. The first patient showed evidence of advanced bone disease on roentgenologic examination but had experienced only minimal clinical symptoms. The second showed the marked soft tissue changes associated with this disease with only slight roentgenologic evidence of bone disease, and his brother had clubbing to a lesser degree without roentgenologic evidence of bone disease.

CASE REPORTS

Case 1. This patient is a 35-year-old man who first noticed pain, swelling, and increased heat of the wrists, ankles, and the interphalangeal joints in 1941 while on duty in Puerto Rico. He was treated with bed rest and salicylates. He became symptom free after five weeks and was returned to full military duty. He first noticed progressive clubbing of the fingers and toes during the period of bed rest. A chest roentgenogram was normal but bone films were not taken. The patient has been asymptomatic except for one transient episode of pain, swelling, and increased heat in the right wrist. He has had no disability except the inability to bowl properly because of the size of his finger tips.

The patient is married and has one normal child. His past history is not significant. Physical examination revealed a healthy appearing man with marked clubbing of the fingers and toes and with swelling of both ankles, especially marked over the medial malleoli. There was no limitation of motion in any joint although crepitus of both ankles was present. The skin was coarse and deeply creased over the finger joints.

Chest and skull roentgenograms were normal. Roentgenograms of the spine showed early hypertrophic changes of both sacroiliac joints and of the anterior and lateral aspects of the lumbar vertebral bodies. The borders of the medial condyles of both tibias

From U. S. Air Force Hospital, Rhein/Main Air Base, Germany.

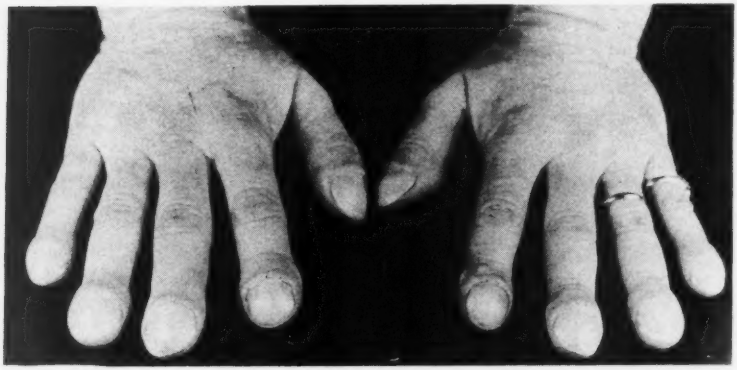

Figure 1 (case 1). Photograph shows enlargement of fingers due to underlying exostoses of distal phalanges.

showed slight periosteal proliferation. The patellas revealed areas of decreased calcification surrounded by areas of hypertrophic bone. Both medial malleoli were enlarged and showed multiple exostoses with osteoporosis of underlying bone. The lateral aspect of the head of the first left metatarsal bone was completely separated. There was soft tissue enlargement of all finger tips (fig. 1) with multiple exostoses of the distal phalanges. An electrocardiogram, basal metabolic rate, and routine laboratory tests were normal.

Case 2. This man is 25 years old with a lifelong history of marked clubbing of both fingers and toes without pain, swelling,

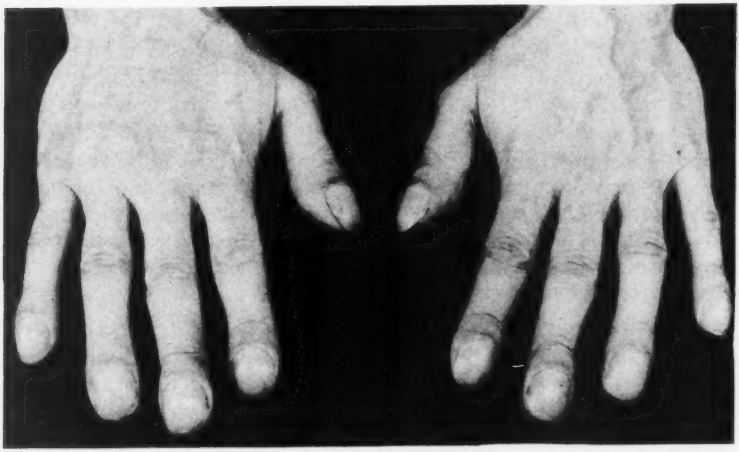

Figure 2 (case 2). This patient presented clubbing of the fingers.

or increased heat in any joint. His past history includes measles, mumps, and bilateral pneumonia at the age of seven years with full recovery. His father has thick, curved fingernails, but the presence of clubbing was undetermined. His brother has clubbing of fingers and toes but to a lesser degree than this patient.

This patient was first hospitalized in March 1951 because of recurrent headaches. Roentgenograms of the skull, electroencephalograms, and examination of the optic fundi were said to be normal. In June 1951, he was admitted because of morning cough and clubbed fingers. The chest roentgenogram, bronchoscopy, and bronchograms were normal, and the patient was returned to full military duty. At this hospital in 1952, his general physical

Figure 3 (case 3). This patient is a brother of patient 2 with lifelong swelling of finger tips.

examination was within normal limits except for marked clubbing of both fingers (fig. 2) and toes. On roentgenologic examination the tips of all fingers showed marked soft tissue swelling, but the ungual tufts, distal phalanges, and articulations of all joints were normal. The long bones showed no signs of periosteal proliferation. The shafts of the first proximal phalanges of his feet showed small lateral spurs with some thickening of the periosteum over the diaphyses. Laboratory tests were normal.

Case 3. This patient is a 24-year-old man, brother of patient 2, who has been well all his life except for swelling of his finger tips (fig. 3). The general physical examination and clinical findings were within normal limits. Roentgenograms of the chest, skull, and bones were normal.

DISCUSSION

Chronic idiopathic hypertrophic osteoarthropathy and clubbing of the fingers and toes are generally considered as manifestations of the same pathologic process. The bone changes of hypertrophic osteoarthropathy and the soft tissue changes of clubbing are tissue responses to stimuli which have not been fully described, but references to these changes date from the time of Hippocrates in the fifth century B. C. The onset or acceleration of these changes during adolescence and the superficial resemblance of these changes to acromegaly point to hormonal activity as the cause of these conditions. Fried[1] first suggested that a hormonal imbalance between the lungs and the pituitary gland might result in hypertrophic pulmonary osteoarthropathy, and Bloom[2] reported a case of carcinoma of the lung with metastasis to the pituitary gland. The association of gynecomastia in these patients also supports a possible endocrine imbalance as underlying these changes. Mendlowitz[3] believes that increased peripheral blood flow is a causative factor in hypertrophic pulmonary osteoarthopathy, and that this should aid research into the pathogenesis of hypertrophic osteoarthropathy and clubbing. An increase in peripheral blood flow, however, is not present in many of these patients. Camp and Scanlan[4] conclude that hereditary predisposition is a prime causative factor in the development of this disease because there is familial involvement in about 60 percent of the reported cases. Carruthers[5] reported two brothers with hypertrophic osteoarthropathy and clubbing somewhat similar to those reported in this communication. A full understanding of the pathogenesis of these changes seems to be as elusive as it was when Marie[6] first described these changes in 1890.

Chronic idiopathic osteoarthropathy is similar in many respects to syphilitic osteitis, rickets, osteitis deformans, and acromegaly.[7] One should not experience any difficulty, however, in differentiating hypertrophic osteoarthropathy from these other bone diseases because of its characteristic roentgenologic appearance.

The roentgenologic features of this disease are characteristic and consist of slowly progressive ossifying periostitis beginning in the distal end of the diaphysis and later involving the entire shaft of the bone.[8] The tibias, fibulas, radii, ulnas, femurs, humeri, metacarpals, and metatarsals are most frequently involved. The terminal phalanges may become hypertrophic but as the disease progresses atrophic changes may result in varying degrees of osteoporosis. The roentgenologic picture of chronic idiopathic osteoarthropathy is indistinguishable from that of hypertrophic pulmonary osteoarthropathy which may be a secondary complication of congenital heart disease with cyanosis, subacute bacterial endocarditis, tuberculosis, pulmonary suppuration,

pulmonary fibrosis, and pulmonary neoplasm.[3,9] Hypertrophic pulmonary osteoarthropathy may be the presenting symptom of a pulmonary neoplasm if the onset of clubbed fingers is sudden and of short duration.[10,11]

REFERENCES

1. Fried, B. M.: Chronic pulmonary osteoarthropathy; dyspituitarism as probable cause. *Arch. Int. Med.* 72: 565-580, Nov. 1943.

2. Bloom, W.: Pituitary implications in hypertrophic pulmonary osteoarthropathy. *Ann. Int. Med.* 29: 361-370, Aug. 1948.

3. Mendlowitz, M.: Clubbing and hypertrophic osteoarthropathy. *Medicine* 21: 269-306, Sept. 1942.

4. Camp, J. D., and Scanlan, R. L.: Chronic idiopathic hypertrophic osteo-arthropathy. *Radiology* 50: 581-593, May 1948.

5. Carruthers, L. B.: Idiopathic hypertrophic osteoarthropathy familial in type. *J. Christian M. A.* 18: 1-3, Jan. 1943.

6. Marie, P.: De L'ostéo-arthropathic hypertrophiante pneumique. *Rév. de Méd. Paris* 10: 1-36, 1890.

7. Campbell, D. C.; Sacasa, C. F.; and Camp, J. D.: Chronic hypertrophic osteo-arthropathy. *Proc. Staff Meet., Mayo Clin.* 13: 708-713, Nov. 1938.

8. Berk, M.: Chronic idiopathic hypertrophic osteoarthropathy. *New England J. Med.* 247: 123-126, July 24, 1952.

9. Compere, E. L.; Adams, W. E.; and Compere, C. L.: Generalized hypertrophic pulmonary osteoarthropathy; experimental and clinical study with report of 2 cases. *Surg., Gynec. & Obst.* 61: 312-323, Sept. 1935.

10. Craig, J. W.: Hypertrophic pulmonary osteo-arthropathy as first symptom of pulmonary neoplasm. *Brit. M. J.* 1: 750-752, Apr. 10, 1937.

11. Pattison, J. D., Jr.; Beck, E.; and Miller, W. B.: Hypertrophic osteoarthropathy in carcinoma of lung. *J. A. M. A.* 146: 783-787, June 30, 1951.

Fat in the Diet

The present high level of fat in the American diet did not always prevail and this fact may not be unrelated to the indication that coronary disease is increasing in this country. In the past 40 years the contribution of fats to the total metabolism in the United States has risen by more than 25 percent; in the past 20 years the rise has been almost 13 percent. In the fact of all the evidence, is this situation desirable? One may seriously ask whether the current nutritional and dietetic teaching in this country is as completely on the right track as some may suppose. Complete indifference to the amount of the fat in the diet is the attitude currently expressed by both technical and popular books and articles on diet.

—ANCEL KEYS, M. D.
in *Journal of The Mount Sinai Hospital*

PALLIATIVE TREATMENT FOR ABNORMALITIES OF THE PALATE AND MANDIBLE IN THE NEWBORN

PHILIP S. FAILLO, *Major, DC, USAR*

PREMATURE newborn infants with congenital abnormalities of the mouth and face frequently present serious complicating problems. Most frequently, these are related to some abnormality in the development or closure of the embryonic fissures but many other types of deformities do not have as definite a basis of origin.

Sometime after the fifteenth day of conception, the cavity, from which will be formed the future mouth and nose, is bounded from above by a tubercle projecting from the anterior part of the head, or frontonasal process, and on each side by the maxillary processes (fig. 1). The mandibular processes join in the midline at about the fifth fetal week and together form the lower jaw or mandible, representing the first pair of visceral arches. The maxillary processes do not meet in the midline, but remain wedged between the frontal and mandibular parts. The cavity is then bounded laterally by the maxillary, and from above by the frontal processes and from below by the mandible. At about this time, on the lower end of the developing frontal process, three tubercles appear, the central and lateral processes (fig. 2). From the frontonasal and the nasal processes, the forehead, external nose, and central part of the lip is formed.

The maxillary process is separated from the lateral nasal process by the orbital fissure which extends to the mouth, and in the upper part of which the eye is developed. The frontonasal and maxillary processes are separated from the lower jaw by a transverse fissure, the median part of which will be the future external mouth slit.

Any and all of the typical face clefts are produced by the nonclosure of any part of the fissures or of the cleft which existed in the midline between the mandibular processes, or the medium groove between the globular processes. A study of the regional

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embryology reveals the variety and extent of defects that are possible.

Many theories have been advanced, but no one definite cause has been established for any single deformity. Various mechanical causes have been advocated, as well as external injury, infection, malnutrition, tumors, and maternal impressions. In some instances of extensive deformities in a newborn infant when a serious injury, malnutrition, or nervous shock occurred during pregnancy, it may be difficult to dissociate the two conditions. Heredity is the most significant factor in the incidence of cleft

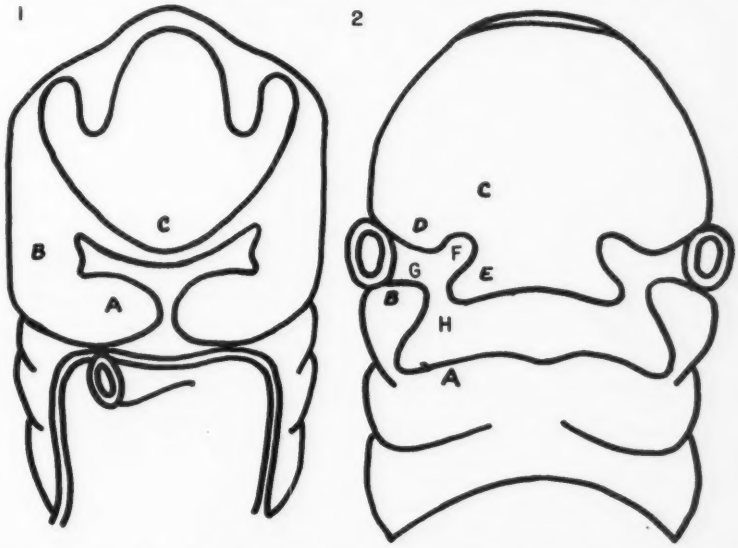

Figure 1. Head of the fetus at the end of fifth week (after His[1]). (A) Mandibular process. (B) Maxillary process. (C) Frontonasal process. Figure 2. Head of the fetus in the seventh week (after His[1]). (A) The new united mandibular process. (B) Maxillary process. (C) Frontonasal process. (D) Lateral nasal process. (E) Globular process attached to the nasal part of the frontonasal process. (F) Lateral nasal grooves which represent the anterior nares. (G) Orbital fissure. (H) Transverse fissure.

lip and palate. Instances of multiple occurrences in the same generation have been noted but the incidence is not high enough to advise an individual family against having other children.

Deformity of the cleft palate may occur in any degree ranging from a slight notch in the uvula to a wide-open cleft extending through the alveolus with bilateral involvement.

REPORT OF A CASE

A seven-month-old premature infant was born with a cleft palate and an undeveloped chin (micrognathia) (fig. 3). With insufficient room for the tongue to lie on the floor of the mouth, and because of the cleft in the palate, there was a tendency for the tongue to drop posteriorly backward into the cleft of the palate creating difficulty in breathing and in feeding the infant.

Figure 3. A premature infant with a cleft palate and undeveloped chin.

The baby was placed in an incubator with a constant flow of oxygen. When removed from the incubator, the child had the appearance of acute anoxia. The condition was relieved when the tongue was pulled forward and out of the cleft by a ligature which was passed through its median raphe and secured to the face with adhesive strips. When the tongue was in this position, the infant had no difficulty in breathing and feeding was made easier.

The ligature was removed after a week, because it was cutting through the tongue. The difficulty in breathing immediately re-

curred and signs of anoxia developed. Two other attempts were made to ligate the tongue in different areas but the same difficulty was experienced and it became badly lacerated. The infant continued to suffer from anoxia even while it was in the incubator. A final effort of ligation was made by placing a mattress suture through the tongue and securing it through the lower lip, fastened over rubber tubing. Within 48 hours this suture also cut through the tongue.

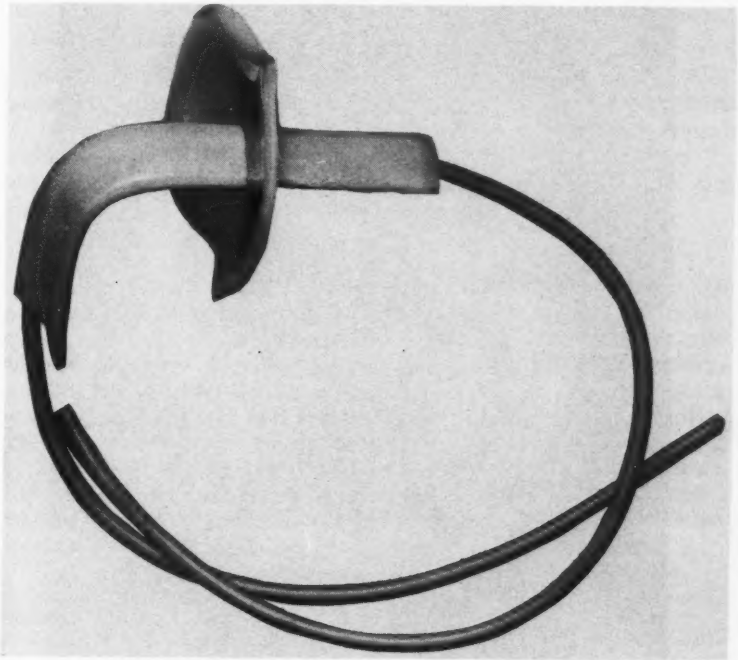

Figure 4. Airway appliance constructed of acrylic to hold tongue in position and permit feeding of infant.

Because the child was losing weight an acrylic appliance, which would hold the tongue forward and out of the cleft, and also provide a feeding tube through which a catheter could be inserted, was constructed. A tubular airway was first made and fitted in such a manner that it would hold the tongue forward but not encroach upon the epiglottis. A mouth shield was then fitted around the anterior portion of the airway so that it would not move downward or laterally.

A wax model was constructed and flasked much in the same manner as acrylic dentures are made. The only difficulty en-

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countered was in securing a smooth and constant diameter of the lumen of the airway. This was overcome by using cold-cure acrylic monomer[2] to make the open side of the airway after it was removed from the flask. Thus, two thirds of the appliance was made with the usual cure-type acrylic and the remaining one-third, which produced closure of the lumen, was of the cold-cure type of acrylic monomer. The appliance was highly polished and

Figure 5. Airway appliance in place.

its edges were rounded so that it would not irritate the mucous membranes of the infant's pharynx and oral cavity.

This appliance was inserted and secured with adhesive strips to the infant's cheeks, forehead, and chin. The appliance was accepted immediately, normal breathing was restored, and the signs of anoxia disappeared. A No. 8 catheter was easily inserted through the hollow portion of the airway for feeding and the infant gained weight rapidly.

Some irritation and edema of the pharynx and oral cavity were noted but soon disappeared. The infant progressed well and a

second, more efficient appliance was constructed (fig. 4). The ventral portion of the appliance again was constructed along the lines of the airway, but flatter. Its width was increased so that the child could not displace the appliance laterally. A tubular portion was added to the dorsal surface of the apparatus, which would admit a catheter varying in size from No. 8 to No. 10. The mouth shield was improved by inclusion of a notch for the chin and the lower portion of the nose. Because of the skin irritation caused by adhesive tape, cloth tape was substituted and tied about the head (fig. 5). With two interchangeable appliances, cleanliness was facilitated.

For two months the infant thrived and progressed until it was considered that the process of weaning from the appliance should be started. Unfortunately, as in most infants with congenital anomalies, symptoms appeared indicating severe anomalies in other parts of the body. The infant contracted pneumonia and died.

CONCLUSIONS

I believe that in rare instances such as this, the close co-operation of the dental and medical services can be of inestimable value. Appliances of this nature can be quickly constructed by the dentist because of his technical knowledge and high degree of manipulative skill. The dental services as a rule have a qualified oral and maxillofacial surgeon who is familiar with the detailed anatomy of the oral cavity and acquainted with the newer and better acrylic materials which are being produced. The medical services also have men well trained in pediatrics, and the teamwork and co-operation of these officers are needed to obtain the desired results.

REFERENCES

1. His, W.: *Anatomie Menschlicher Embryonen.* F. C. W. Fogel, Leipzik, Germany, 1880-1885.

2. Tylman, S. D., and Peyton, F. A.: *Acrylics and Other Synthetic Resins Used in Dentistry.* J. B. Lippincott Co., Philadelphia, Pa., 1946. p. 33.

Bacterial allergy is believed to play a major role in the morbidity of tuberculosis, the pathogenesis of rheumatic fever, and in infectious asthma. It is also thought to be an important factor in acute nephritis, brucellosis, rheumatoid arthritis, "Id" reactions, urticaria, angioneurotic edema, vasomotor rhinitis, iritis, uveitis, focal infections and perhaps in pneumonia, meningitis and numerous other conditions.

—OSCAR SWINEFORD, JR., M. D.,
in *Virginia Medical Monthly*

CASSETTE CHANGER FOR ANGIOGRAPHY AND ANGIOCARDIOGRAPHY

WILLIAM H. WEHRMACHER, *Lieutenant, MC, USNR*

GEORGE F. STOCKER, *Commander, MC, USN*

CONFIRMATION of the clinical diagnosis of cardiac and peripheral circulatory disease is often desired when elaborate equipment is not available for this purpose. The simple, inexpensive, easily constructed cassette changer herein described makes angiography and angiocardiography available for the military hospital only occasionally requiring these procedures. It is not meant to substitute for more elaborate apparatus available in medical centers and research institutes, but is convenient where limited frequency of use does not justify the larger investment.

The Apparatus

The changer consists essentially of a tunnel running beneath the patient and through which film-bearing cassettes are propelled. It will carry four cassettes, one registering beneath the patient, and three in readiness to the side. We find it convenient to use five cassettes, a final one being loaded by the technician at the discharge shute after he has caught the previously exposed cassettes.

Hospital carpenters constructed our apparatus from material available for regular hospital repairs. As figures 1 and 2 show, a wooden platform of heavy beams (1)* braced with cross bars (2) lies at right angles across the x-ray table. Although the wooden platform extends considerably to the side of the table, no special supports are necessary. The weight of the superstructure and of the patient lying across it gives it adequate stability. The undersurface of the platform is notched in a width equal to that of the x-ray table to fix it in position across the table. The upper surface of the wooden platform is grooved to receive a sliding metal framework (3) which holds four 14- by 17-inch cassettes.

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*Numerals refer to indicated parts of figure 1.

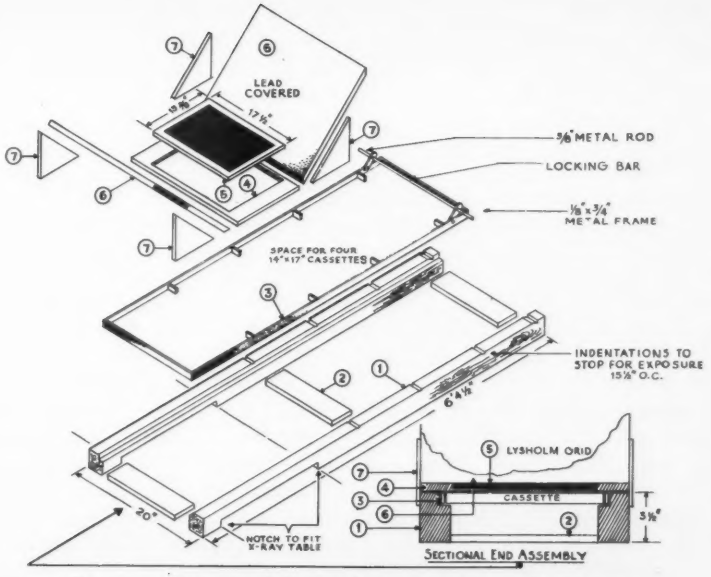

Figure 1. Diagram of the rapid cassette changer from above.

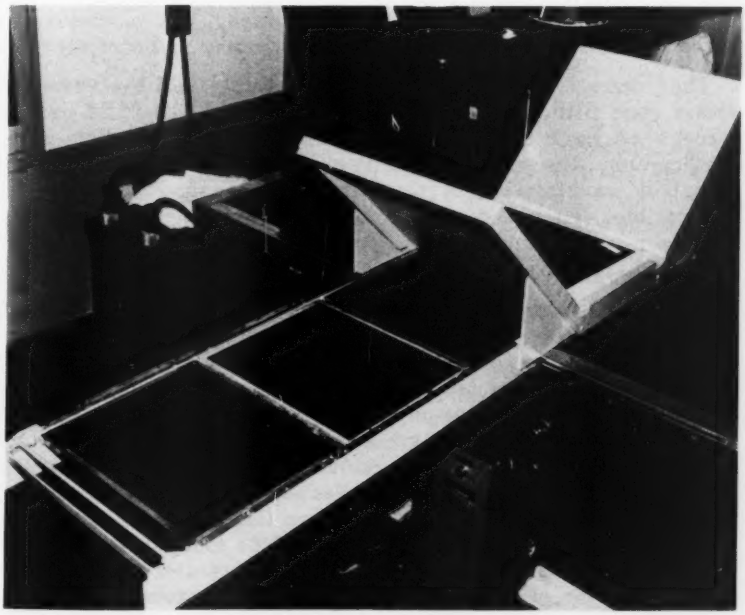

Figure 2. Photograph of changer from below.

The metal framework slides between the beams of the wooden platform and, thereby, carries the x-ray cassettes beneath the patient for serial exposures. Above the platform, in that portion notched for the x-ray table, there is a leaded, double-winged superstructure (6) supported by small wooden triangles (7). The wings extend upward and outward at 45° angles and shield the films which are not registered for exposure beneath the patient. A frame (4) supports a Lysholm grid (5) beneath the patient. A small, metal handle, attached to the sliding metal framework, drops into notches along the beams of the wooden platform as the metal framework is being advanced. This stops the framework in exact positions so that the contained cassettes lie appropriately registered for successive exposure beneath the patient and the Lysholm grid.

Procedure

Exposures can be made at intervals as short as one-half to one second, or slower if desired. Exposures are made by the operator of the sliding metal frame with an extension hand switch activating the x-ray tube. He rapidly determines that film is in appropriate registry beneath the patient when he feels the locking bar of the sliding frame fall into the notches of the supporting wooden framework.

Diodrast (35 percent iodopyracet), commonly used in urologic studies, can be used in venous angiography, but a special 70 percent solution is necessary for arteriography and cardiography.

The contrast drug must be delivered rapidly into the vessel to attain good filling and contrast, and, therefore, should be passed through as large a needle or cannula as applicable. For angiocardiography, the special large-bore, 50-cc. syringe and the Robb-Steinberg modification of the Lindeman transfusion needle are appropriate. To further speed the flow in angiocardiography, the patient is requested to make a forceful inspiration as the drug is rapidly discharged into the vessel.

Exposure timing is planned to coincide with the contrast drug's appropriate position within the circulatory system. Arteriograms are made extremely fast because the drug rapidly escapes from the field of injection in this high pressure system. In phlebography, prompt exposure of the films is necessary to demonstrate the medium before it has been swept away by the blood flow. In angiocardiography, circulation-time determinations with an equal volume of test solution (ether, sodium dehydrocholate, sodium cyanide, etc.) may aid exposure timing. In the absence of stasis, however, exposures within the first four seconds of injection most satisfactorily demonstrate the greater venous return and lesser circulation; whereas, exposures between seven and

ten seconds after the injection demonstrate the left side of the heart and aorta.

It is obvious that the patient must be immobile during exposure of the x-ray films. This simple requirement necessitates skillful explanation to secure the patient's full co-operation. Ordinarily, the chest is kept in full inspiration during angiocardiographic exposure. The patient must be instructed to avoid straining against the closed glottis in holding his breath.

Radiographic exposure factors are increased about 10 kilovolts above the usual to improve the demonstration of the contrast drug. It is desirable to use as short an exposure as practicable to avoid blurring incident to movement of the structures being studied. The physicians and technicians making angiograms by any technic are subjected to moderate x-irradiation. They should protect themselves from x-ray exposure with leaded rubber aprons, gloves, and other improvised shields. More detailed instructions for those unfamiliar with conventional angiocardiographic technics can be found elsewhere.[1,2]

REFERENCES

1. Hochberg, L.; Smith, D. C.; and Dotter, C. T.: Technique of angiocardiography. *X-ray Tech.* 20: 331-335, May 1949.

2. Dotter, C. T., and Steinberg, I.: *Angiocardiography.* Annals of Roentgenology, Series of Monographic Atlases, vol. 20. Paul B. Hoeber, Inc., New York, N. Y., 1951.

Injuries to the Hand

Despite the fact that the hand is exposed and subject to many injuries, there is a tendency to neglect such trauma. Not only does the patient frequently pay little attention to an injury to the hand, but there is a tendency for the profession to consider such injuries of minor importance. In many hospitals they are considered under the questionable term of minor surgery, and assigned to the least skilled of emergency personnel.

It is imperative that injuries to the hand receive the most skillful care because this structure is an intricate mechanism and loss of function causes great hardship, especially in those individuals who earn their living by use of their hands.

—JOSEPH L. POSCH, M. D.
in the *Surgical Clinics of North America*

FRAMES FOR SPECTACLES IN ARCTIC CLIMATE

ERNEST M. FULFORD, *Captain, MSC, USAR*

ISSUE spectacles with metal or zylonite frames were tested by volunteers under actual and simulated field conditions. Tests were conducted in Alaska at Point Barrow, Ladd Air Force Base, near Fairbanks, Big Delta Arctic Training Center, and at Anchorage and Palmer. No attempt was made to test the frames under controlled laboratory conditions.

The tests and experiments were conducted because of numerous requests from commanders for spectacles with zylonite frames for their troops because the men feared metal frames would freeze to their faces. Having worn metal-framed and rimless spectacles at temperatures of minus 72° F. in the Yukon Territory of Canada without untoward effects, I believed that these fears were groundless but that further investigation seemed indicated.

This study was initiated at Fort Richardson, Alaska, on an overnight problem that included the construction of a lean-to which was to be occupied for the night without a fire. The construction of a lean-to involved a moderate amount of physical exertion for two men for one hour. One member of each two-man team wore a pair of issue metal-framed spectacles with plano lenses or his own prescription. The other wore the standard issue zylonite frame with either plano or prescription lenses. The temperature was minus 21° F. with little or no humidity. During the exercise no evidence of adherence to the skin of the face or the ears by either type of frame was noted.

After the team members retired in sleeping bags for the night, the spectacles were hung over a convenient limb in the lean-to and exposed to a falling temperature for six hours. On arising in the morning with the temperature at minus 29° F., each man with his bare hand picked up the spectacles and immediately put them on. No adherence to the skin of the hand or face occurred. When tests were conducted with moist or wet hands there was slight temporary adherence of the frames to skin but no laceration or tearing of skin occurred.

The bridge of six new zylonite frames at a temperature of minus 29° F. withstood a mean bend from the normal plane of 78° be-

From Alaska General Depot. Capt. Fulford is now at Fort Sam Houston, Tex.

fore snapping, while the bridge of six zylonite frames two or more years old permitted a mean bend of 50.33°. Table 1 shows that the old frame No. 6 throws the mean figure off from what it would probably be if the experiment were carried further. Elimination of the figure of 81° for No. 6 would give a mean of 46°.

TABLE 1. *Flexion tests at minus 29° F.*

Degree of bend from normal plane	
New frames	Old frames
80	42
92	50
70	40
74	38
82	51
70	81
Mean bend 78°	50.33°

The next phase of the test was conducted at Point Barrow, the northernmost point in Alaska. Conditions were ideal at the airstrip for the test. The temperature was minus 68° F. and the wind was moving at 8 knots an hour. Ten persons participated in the test; five wore the standard metal frame and five, the standard zylonite frame. All spectacles had plano lenses and new frames, and were given enough pantoscopic tilt to bring the lower portion of the eyeframe into light contact with the cheeks of each person. Flaps of the cap were worn down and tied beneath the chin.

Even with a light breeze, it was difficult for any person to walk directly into the wind for more than a few feet without shielding the face with the hands. After walking 500 feet, the noses and cheeks of three men showed the white patches of frostbite, but not at points of frame contact with the skin. They were returned to the plane. Two of these were wearing zylonite frames.

At the 900-foot point, the cheeks, chins, and noses of the remaining men showed evidence of frostbite but again there was no frostbite of the skin where the lower part of the eyeframe touched the cheeks.

The next day, a site was selected on the Arctic Ocean, approximately nine miles from the airstrip where a 32-knot wind blew down from the north. Ten new volunteers were selected. Five wore zylonite and five wore metal-framed spectacles. The temperature was minus 62° F., with little or no humidity. Panto-

scopic tilt brought the lower edge of the eyeframe into light contact with the upper portion of the cheek, as before.

The group faced the strong wind and began walking. Profuse tearing began almost immediately, and because the men had been cautioned not to wipe the eyes so that the contact point would not be disturbed, tears ran down to the contact point and froze immediately. Because this would not be a normal situation it was corrected, and the men were told to keep tears wiped away.

The men could not face the wind for more than a few seconds at a time. Evidence of frostbite of the nose occurred in all volunteers by the time they reached the 80-foot point. At the 120-foot mark, the cheeks and chins, as well as the skin at the contact points, of all the men were frostbitten. This portion of the test was concluded at this point because it was not typical of normal work or combat conditions in the arctic because a face mask would ordinarily be worn. A group of about 20 Eskimos who had been watching the tests with great interest and bewilderment, asked to test the spectacles. Ten were selected, and wearing the spectacles, they trotted out to a point about 1,000 feet away and returned. Our observers were surprised to find no visible sign of frostbite at any point on their faces including the contact points of each type of eyeframe.

TABLE 2. *Flexion tests at minus 68° F.*

Degree of bend from normal plane	
Zylonite frame	Metal frame
26	96
32	102
28	110
30	91
10	72
17	68
Mean bend 23.83°	58.16°

Breakage tests were conducted at minus 68° F. Each type of frame was repeatedly dropped six feet onto a steel tread with no shattering apparent; however one zylonite frame did fracture along the top of the left eyeframe. A six-inch drop of a one-pound weight on the frames caused longitudinal and radiating fractures in 10 out of 12 zylonite frames but only bending of nose pads on metal frames. A 12-inch drop of the same weight on the frames shattered 12 new zylonite frames like glass but

only three of 12 metal frames broke at the bridge. Table 2 shows the results of the flexion test on zylonite and metal fronts which had been used six to eight months.

Further wearing and usage tests were conducted at Big Delta Arctic Training Center by four officers wearing prescription spectacles. Two officers used zylonite frames and two, metal frames. The spectacles were worn constantly in temperatures ranging from 15° F. below zero to 35° F. below zero. Activities consisted of building arctic shelters, showshoeing, and skiing. Wearers reported no adherence of the frames to skin or frostbite at the contact points. No discomfort was noticed when putting on the spectacles in the morning.

Records of the 5005th Hospital Group reveal only two cases of frostbite of the face in which spectacles were possibly involved.

CASE REPORTS

Case 1. A repairman was working on an 80-foot aerial tower in a wind velocity of about 12 knots and temperature of minus 22° F. and wearing metal-framed, government-issue spectacles. No discomfort was experienced by the patient, but when he descended his entire face was badly frostbitten. A longitudinal strip of flesh immediately under and in contact with the metal temple pieces was frozen more deeply than the surrounding area, apparently where the metal conducted body heat more rapidly from the skin.

Case 2. A messenger drove 20 miles in an open jeep in a temperature of minus 35° F. with wind velocity unknown, at an average speed of 30 m. p. h. The patient was wearing issue zylonite frames. On arrival at destination, his entire face was badly frozen with deeper involvement of the subcutaneous tissues in a long strip under and touching the zylonite temple piece which again had acted as a conductor.

COMMENT

In spite of the absence of any concrete evidence that metal-framed spectacles cause adherence to or laceration of the skin, requests for extra zylonite or "plastic" frames in anticipation of such an eventuality continued to be made over a three-year period. Army and Air Force regulations prohibit the issue of more than one zylonite frame to an individual. When zylonite frames had not been prescribed by the refractionist, or when the soldier preferred to wear his metal-framed spectacles, his spectacles were fitted with issue temple tubing. (Tubing, temple, transparent, 25 ft., Stock No. 14-730-000). If this tubing was not available, each temple piece was dipped in a liquid of zylonite

solution made by dissolving a few old or broken zylonite frames in acetone. (The solution is also an excellent repair substance for zylonite frames. No particular proportions of zylonite and acetone are necessary as long as the mixture is liquid enough to coat the metal when dipped therein.) This, when hard, prevented corroding of the metal from perspiration, and gave the individual assurance, at least psychologically, that the metal would not freeze or stick to his skin.

SUMMARY

Tests in temperatures ranging from minus 21° F. to minus 68° F. indicate that danger of adherence of metal or zylonite frames to skin in subzero temperatures is negligible. When the skin is moistened sufficiently to cause adherence, the contact surface is so small that no laceration occurs.

Conductivity of both types of frames is so low that freezing at contact points occurs only when cold and wind factors are so great that surrounding areas of skin freeze. No evidence that the wearing of either type of frame is a contributing cause of frostbite exists, nor has any case of laceration of the skin by adherence of temple pieces thereto been reported.

Bending and breaking tests reveal that the tensile strength and fracture resistance of the zylonite frames are lowered when the temperature drops below minus 20° F. The frame will resist abuse at any temperature several times that to which it will normally be subjected.

Metal frames are relatively unaffected by extreme cold. Either type of frame is suitable for wear and use under arctic conditions, but the metal frame is the more suitable.

Nothing can replace the function of the human hand. Even partial preservation of forearm and hand tissue is usually preferable in appearance and usefulness to the most highly developed and specialized prosthetic appliance. It is a cardinal principle of traumatic surgery that extreme conservatism must be practiced in the management of hand and forearm wounds in order to retain as much viable tissue as possible for future rehabilitation. The temptation to perform early amputation must be resisted even in view of extensive tissue destruction. Débridement should include only obviously necrotic material and should be followed with early wound closure or skin coverage.

—ERNEST A. BRAV, Colonel, MC, USA, and
JOHN D. BLAIR, Colonel, MC, USA
in the *American Journal of Surgery*

PUBLICATIONS BY OFFICERS OF THE MEDICAL SERVICES OF THE ARMED FORCES

Baker, W. S., Jr., Comdr., MC, USN; Roy, R. L., Lt., MC, USNR; Bancroft, C. E., Lt., MC, USN; McGaughey, H., Lt., MC, USN; Dickman, F. N., Lt. (jg), MC, USNR; and Tucker, G. W., Lt. (jg), MC, USNR: Congenital anomalies of uterus associated with pregnancy; analysis of 118 cases from literature with report of 9 additional cases. *Am. J. Obst. & Gynec.* 66: 580-597, Sept. 1953.

Bell, L. G., Capt., MC, USN; Brown, R. B., Capt., MC, USN; and Lenhardt, H. F., Comdr., MC, USN: Acute pneumocholecystitis; review and report of two cases. *Ann. Surg.* 138: 268-274, Aug. 1953.

Brody, S. L., Comdr., MC, USN: Operational hazard of microwave radiation. *J. Aviation Med.* 24: 328-333, Aug. 1953.

Bullwinkel, H. G.: Audiologist and otologist: their close relationship. *Hearing News* 21: 11-12, Sept. 1953.

Cain, C. C., Lt. Col., USAF, and Mahoney, D. I., Maj., USAF (MC): Effect of high breathing pressure on cardiac output with and without counter pressure. *J. Aviation Med.* 24: 308-321, Aug. 1953.

Crosby, W. H., Lt. Col., MC, USA: Paroxysmal nocturnal hemoglobinuria relation of the clinical manifestations to underlying pathogenic mechanisms. *Blood* 8: 769, Sept. 1953.

Erdbrink, W. L., Lt., MC, USN: The reserve aviator. *J. Aviation Med.* 24: 230-233, June 1953.

Halbouty, M. R., Col., USAF (MC), and Long, D. R., Capt., USAF (MC): Neurocirculatory collapse in aircraft flight; report of case. *J. Aviation Med.* 24: 301-307, Aug. 1953.

Handford, S. W., Lt. Comdr., MSC, USN; Cone, T. E., Jr., Comdr., MC, USN; and Gover, S. C.: Ship's motion and incidence of seasickness. *Mil. Surgeon* 113: 157-167, Sept. 1953.

Jones, P. N., Capt., USAF (MC); Bigham, R. S., Jr., Maj., USAF (MC); and Manning, P. R., Lt., USAF (MC): Use of antibiotics in nonbacterial respiratory infections. *J. A. M. A.* 153: 262-264, Sept. 26, 1953.

King, J. H., Jr., Col., MC, USA, and Forrest, R. L., Maj., MC, USA: Vaccinia of eyelids; treatment by aureomycin in second case. *J. A. M. A.* 153: 31-32, Sept. 5, 1953.

Kydd, W. L., Capt., DC, USA: Preliminary study of lateral deformation of metal base dentures in relation to plastic base dentures. *J. Pros. Dent.* May 1953.

Lay, F. I., Lt. Col., USAF (AFNC): The flight nurse as a leader. *Mil. Surgeon* 113: 196-200, Sept. 1953.

Liston, D. E., Col., MC, USA, and Giesecke, C. G., Col., MC, USA: Evacuation by Army aviation during Exercise Long Horn. *Mil. Surgeon* 113: 167-171, Sept. 1953.

Mayer, C. F., Lt. Col., MC, USAR: Endemic panmyelotoxicosis in Russian grain belt; clinical aspects of alimentary toxic aleukia (ATA); comprehensive review. *Mil. Surgeon* 113: 173-189, Sept. 1953.

McGovern, R. E., Capt., MC, USA, and Luscombe, H. B., Col., MC, USA: Useful modifications of progressive resistive exercise technique. *Arch. Phys. Med.* 34: 475-477, Aug. 1953.

Miller, F. L., Maj., MC, USA, and Walker, R., Capt., MC, USA: Clinical toxicity of terramycin. *New England J. Med.* 249: 479-481, Sept. 17, 1953.

Osborne, W. W., Maj., USAF (MC), and Foster, C. D., Capt., USAF (MC): Diaphragmatic hernia complicating pregnancy. *Am. J. Obst. & Gynec.* 66: 682-684, Sept. 1953.

Peterson, W. F., Maj., USAF (MC), and Goldzieher, J.: Adrenal hemorrhage in pregnancy. *Am. J. Obst. & Gynec.* 66: 648-653, Sept. 1953.

Plough, I. C., Maj., MC, USA; Teschan, P. E., Capt., MC, USA; and Seligson, D., Capt., MC, USA: Toxic effects of modified human globin. *J. Lab. & Clin. Med.* 42: 224-231, Aug. 1953.

Pulaski, E. J., Lt. Col., MC, USA: Antibiotics for surgical infections of gastrointestinal tract. *Surg., Gynec. & Obst.* 97: 353-360, Sept. 1953.

Redmond, R. F., Capt., USAF (MC); Milch, L. J., Maj., USAF; and Calhoun, W. W., Second Lt., USAF (MSC): Plasma lipoprotein changes induced by mild local cold injury. *J. Lab. & Clin. Med.* 42: 112-115, July 1953.

Rodney, M. B., Capt., MC, USA; Sonnenberg, B.; and Dalton, R. R., First Lt., MSC, USA: Survey of intestinal parasitic infection found in feces of formalin-fixed appendices. *Mil. Surgeon* 113: 200-205, Sept. 1953.

Rothwell, W. S., Capt., USAF (MC), and Sperry, E. G., First Lt., USAF: Escape from aircraft by downward ejection. *J. Aviation Med.* 24: 322-327, Aug. 1953.

Schuyler, V. H., Lt. (jg), MC, USNR, and Shaw, C. C., Capt., MC, USN: Leukemoid blood reactions. *New England J. Med.* 249: 434-438, Sept. 10, 1953.

Smith, D. L.; Ferguson, G. W., Comdr., DC, USN; and Schoonover, I. C.: Microstructure of dental amalgam. *J. Am. Dent. A.* 47: 305-311, Sept. 1953.

Stauffer, F. R., Lt. Comdr., MC, USN: Acceleration problems of naval air training; normal variations in tolerance to positive radial acceleration. *J. Aviation Med.* 24: 167-188, June 1953.

Umiker, W., Comdr., MC, USN, and Skeen, M., Lt. (jg), MC, USNR: Carcinoma of ovary with malignant cells in vaginal smear of asymptomatic patient. *Am. J. Obst. & Gynec.* 66: 674-677, Sept. 1953.

Van Wyk, J. J.; Baxter, J. H.; Akeroyd, J. H., Lt. Col., MSC, USA; and Motulsky, A. G., First Lt., MC, USA: Anemia of copper deficiency in dogs compared with that produced by iron deficiency. *Bull. Johns Hopkins Hosp.* 93: 4, July 1953.

Walker, W. J., Lt. Col., MC, USA; Lawry, E. Y.; Love, D. E.; Mann, G. V.; Levine, S. A.; and Stare, F. J.: Effect of weight reduction and caloric balance on serum lipoprotein and cholesterol levels. *Am. J. Med.* 14: 654-664, June 1953.

Wannamaker, L. W., Capt., MC, USAR; Denny, F. W., Maj., MC, USAR; Perry, W. D., Capt., USAF (MC); Rammelkamp, C. H., Jr.; Eckhardt, G. C., Capt., MC, USAR; Houser, H. B., Maj., MC, USAR; and Hahn, E. O., Maj., MC, USAR: Effect of penicillin prophylaxis on streptococcal disease rates and the carrier state. *New England J. Med.* 249: 1-7, July 2, 1953.

Webster, A. P., Comdr., MSC, USN: High altitude—high velocity flying with reference to human factors; opening shock of parachute descents. *J. Aviation Med.* 24: 189-199, June 1953.

White, M. S., Brig. Gen., USAF (MC), and Merkle, R. W., Maj., USAF (MC): Evacuation and care of casualties in aircraft. *J. A. M. A.* 153: 20-22, Sept. 5, 1953.

Wiggins, H. E., Comdr., MC, USN; Bundens, W. D., Comdr., MC, USN; and Park, B. J., Lt., MC, USN: Complications following open reduction and plating of fractures of tibia. *Am. J. Surg.* 86: 273-281, Sept. 1953.

BOOK REVIEWS

Criteria for Retirement, A Report of a National Conference on Retirement of Older Workers, edited by *Geneva Mathiasen.* 233 pages. G. P. Putnam's Sons, New York, N. Y., 1953. Price $3.50.

By prolonging life medical science has created a new social problem of an aging population. This conference represents one phase of the earnest effort being expended in the search for a solution that will enable older people to live in dignity and comfort. Those in attendance believed that there is much to be learned by industry from the Armed Forces' use of the physical evaluation board for retirement of personnel. One of the conclusions, though not a unanimous one, was that chronologic age as a sole basis for retirement should now be abandoned by both business and Government. Objective criteria (other than job-performance experience) which can be used as a basis for either retirement or change to another job do not at present exist. It was agreed that retirement based on chronologic age is both socially unwise and economically unsound. This volume should be available to all Armed Forces personnel who occupy policy-making positions.

—*Col. R. E. Blount, MC, USA*

Battle Casualties, Incidence, Mortality, and Logistic Considerations, by *Gilbert W. Beebe,* Ph. D., and *Michael E. DeBakey,* M. D. 277 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1952. Price $10.50.

This book is a thorough and comprehensive treatise on battle casualties based upon the authors' studies and statistical analysis of very extensive military records on this subject from World War II and in part from World War I and a few of historical interest from the Spanish American and U. S. Civil War. It is of particular interest and of value to those concerned with large-scale medical planning for combat operations; also to those who work in any medical echelon dealing with casualties.

The book is divided into six sections. Section one outlines the mission of the book and discusses the statistics from which it was compiled. Section two deals with the relative incidence of battle and nonbattle casualties and the incidence of hits and wounds relative to many variable factors. In section three, death from wounding and the mechanism of death in battle casualties

are discussed. Section four is devoted to the effectiveness of weapons. In it the authors discuss the strategic value of wounding and the lethality of various casualty-producing agents. Section five is concerned with the location of wounds relative to position of body and type of missile. It contains an evaluation of body armor and has an interesting evaluation of the effect of aimed vs. unaimed fire. Amputations and burns are also discussed. Section six deals with the logistic problem of personnel and with hospitalization in forward areas, both from the standpoint of patient welfare and of military expediency. The number of surgical specialists needed in the forward areas is discussed, and modifications imposed by air evacuation are considered.

The book is particularly noteworthy for its successful effort to properly analyze the vast amount of data which have been collected on battle casualties and to extract from it detailed information of value and interest to all who deal with or plan for battle casualties. The book is well written and holds the reader's interest in spite of its statistical nature.

—Maj. P. J. Kowallek, Jr., MC, USA

Aviation Toxicology, An Introduction to the Subject and a Handbook of Data, Prepared under the direction of the *Committee on Aviation Toxicology*, Aero Medical Association. 120 pages; illustrated with graphs. The Blakiston Co., New York, N. Y., publishers, 1953. Price $4.

Inhalation of carbon monoxide, carbon dioxide, and gasoline vapor have long been the greatest toxicologic hazards to both pilots and passengers during flight, and this small volume indicates that these substances still hold this dubious distinction. It also brings between covers for the first time much valuable data concerning the dangers from many new noxious substances that may be encountered in aircraft. These include chemicals employed in antifreezing agents for deicing equipment, and others used in fire extinguishants, hydraulic fluids, propellants, refrigerants, and insecticides or which may be part of the plane's cargo.

This useful handbook is divided into three parts which cover the general features of aviation toxicology, its specific problems, and the important chemicals involved. There are appendices which contain time-concentration curves of toxicity, methods of calculating the concentration of carboxyhemoglobin in the blood stream at high altitude, and toxicity data for individual compounds. In the list of references there are 75 titles to current literature. An adequate index of chemicals is included.

The Committee on Aviation Toxicology of the Aero Medical Association has performed a valuable service to the aviation industry and the flying public in preparing this book for publication. Flight surgeons will welcome it as a guide and reference to the problems in toxicology with which they are faced, and those

responsible for flight safety, maintenance, and operations will perform their tasks with greater vigilance if they are familiar with its contents.—*Col. R. J. Benford, USAF (MC)*

Man's Back, by *Theodore A. Willis,* M. D. 161 pages; 210 illustrations. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $9.50.

This is a treatise on how to examine, understand, and treat the back. The author has had a long practice and draws on a wealth of material. He has selected for discussion those important medical and surgical discoveries regarding the back that have withstood the test of time and demonstrated their usefulness.

The coverage is comprehensive and includes simple and excellent reviews of the embryology and anatomy of the back. Vertebral anomalies are also considered. The explanation given for the mechanism of injury associated with these is both logical and clear, but it is difficult to understand why spondylolisthesis is classified under anomalies and developmental defects, considering the weight of evidence against this.

The chapter on the examination of the back is comprehensive, simple, and complete. That on injuries is a "must" reading for the general practitioner and those who desire a better understanding of the mechanism of injury. Comparison of injury of the back to acute sprains of the ankle helps both the doctor and the patient to comprehend and manage the injury. The diseases of the back are well covered, with excellent material on differentiation, and the chapters on tumors, scoliosis, and operations are simple and clear.

This book will have its greatest value for the general practitioner and medical officer in the dispensary. Although there is no bibliography, the style, organization of material, and format are excellent. The illustrations are clear and well chosen, and the index is adequate.—*Comdr. H. A. Streit, MC, USN*

A Clinical Approach to Children's Rorschachs, by *Florence Halpern,* Ph. D. 270 pages; illustrated by charts. Grune & Stratton, New York, N. Y., 1953.

This volume presents the author's approach to the evaluation of children's Rorschach records and her working hypotheses which serve as guideposts in the personality studies of children ranging in age from two and a half to ten years. A good aspect of the book is the inclusion of records of "well adjusted" children in addition to a brief sampling of youngsters manifesting a variety of mental and affective disturbances. It includes a good description of Rorschach administration to very young children.

Although the author states that "the interpretations offered are therefore based exclusively on the Rorschach findings," this is not borne out in several case discussions where inferences ap-

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parently are drawn and "supported by" other data. Also, there is a tendency to use hypotheses applicable to adult Rorschachs for the interpretation of very young children's productions. The need for more validation of such interpretation is evident.

The book is recommended as a reference for clinical psychologists active in child-guidance clinics, and serves to bring into focus the need for more controlled research on this topic.

—Lt. Col. F. A. Zehrer, MSC, USA

Safeguarding Motherhood, by *Sol T. DeLee,* M. D. 3d edition. 140 pages; illustrated with drawings by *Gladys McHugh.* J. B. Lippincott Co., Philadelphia, Pa., publishers, 1953.

This clearly written, well-illustrated volume fulfills its purpose to provide the expectant mother with information on the physical aspects of pregnancy and labor and aids in providing sound psychologic preparation for the mother. This new edition is generally similar to the previous editions and contains much common-sense advice. It emphasizes the importance of confidence in medical supervision and is intended as a sound and comforting supplement to the physician's advice. The material covered should help the expectant mother to co-operate more fully with her physician by aiding her understanding of normal and abnormal obstetrics. The father-to-be section is especially well written. Uncommon and technical words and phrases used in the text are explained in a convenient glossary. An index of the subjects discussed has also been provided for easy reference. This book can be heartily recommended to prospective mothers and fathers.

—Col. E. A. Zimmermann, MC, USA

Glaucoma Pathology and Therapy, by *Paul Weinstein,* M. D., Associate Professor of Medical Ophthalmology, at the University of Budapest; Chief of the Eye Department of the Jewish Hospital at Budapest. Translated by *Julius Foldes,* M. D., Diplomate of the American Board of Pathology; Fellow of The College of American Pathologists; Director of Laboratories, Hazleton State Hospital and St. Joseph's Hospital, Hazleton, Pa. 295 pages; illustrated. The C. V. Mosby Co., St. Louis, Mo., publishers, 1953. Price $8.

As a work on glaucoma that tries to gather a complete review of the subject into one small volume, this monograph accomplishes its purpose and fills a decided need. It contains a complete international bibliography of the literature on glaucoma published between 1930 and 1950. This bibliography fills 116 pages of small print.

The volume contains chapters on the history, diagnosis, clinical classification, frequency, and etiology of glaucoma. An interesting aspect is the non-American reflection given to the subject. This is well preserved in the translation. The author outlines some of his own work and personal experiences. He notes that in the

Ghetto in Budapest during World War II, a minority of glaucoma patients preserved their vision despite the absence of adequate medical help, and that these were the patients with spontaneous venous pulsation of the central vein of the retina. This indicates the importance of low venous pressure in glaucoma simplex.

Weinstein was a pupil of DeGrosz. In an outline of the treatment of acute primary glaucoma he quotes DeGrosz as saying, "* * * but if the attack does not subside within a three-day period, with frequent pilocarpine installations, then the operation may not be delayed any longer." Few American ophthalmologists would agree with this statement. Many would consider even 12 hours too great a delay.

This monograph should appeal to the student for the bird's-eye view it presents of glaucoma, and to the teacher for its excellent bibliography of the subject.—*Comdr. P. J. Giotta, MC, USN*

Dermatologic Formulary, from the New York Skin and Cancer Unit, Service of Dermatology, edited by *Frances Pascher,* M. D. Revised 1953. 150 pages. Paul B. Hoeber, Inc., New York, N. Y., 1953. Price $3.

The new edition of this excellent book contains the current dermatologic formulary of the skin and cancer unit of the New York University Hospital and represents the combined thought and experiences in dermatologic therapy of many leading dermatologists at that institution since 1882.

The book is divided into three sections, viz, topical remedies, systemic therapy, and articles for clinic use. There are 223 therapeutic items presented, all logically grouped as to type. Each item is briefly discussed as to formula, action and uses, indications, and directions. When applicable, contraindications, side effects, instructions to pharmacist, and additional information are also included. The formulary is essentially complete and contains items reflecting the latest trends in dermatologic therapy, such as use of quinacrine hydrochloride (atabrine) in lupus erythematosis and ACTH and cortisone in dermatology.

This book should prove of use to all members of the medical profession who deal in any manner with dermatologic patients. It also would serve well as a model basic formulary for dermatologic inpatient and outpatient services.—*Comdr. V. Hall, MC, USN*

The Physician in Atomic Defense, Atomic Principles, Biologic Reaction and Organization for Medical Defense, by *Thad P. Sears,* M. D. 308 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1953. Price $6.

The author has chosen a difficult task in attempting to include in a text of this size a résumé of the available material on atomic defense. The volume is divided into three sections:

Atomic Theory, Basic Physics and Atomic Bombs; Clinical, Biologic, Pathologic, and Therapeutic Aspects of Atomic Warfare; and Organization of the Medical Department for Atomic Defense.

The first two sections are written in an intimate, narrative form with considerable poetic license in the description of precise scientific facts, giving the reader the impression that he is listening to the author discuss the subjects. The third section is drawn freely from the military and Federal Civil Defense Administration publications on the subject of atomic defense to which he has added his own experience. The chapter on the management of casualties is an excellent summary of this subject. Because of brevity there is a loss of clarity in certain sections such as the chapter on health physics; the discussion of the cyclotron, synchrocyclotron, and other particle accelerators could have been replaced by an amplification of more pertinent subjects.

The book is enhanced by an extensive bibliography at the end of each chapter and also by a complete index. This publication is a summary of the intended subject which reflects credit upon the enthusiasm and integrity of the author whose industry and diligence in lecturing and planning conferences on this subject have contributed materially to the civil defense effort.

—Lt. Col. G. M. McDonnel, MC, USA

Health and Human Relations, Report of a conference on Health and Human Relations held at Hiddesen near Detmold, Germany, August 2-7, 1951. 192 pages. The Blakiston Co., Inc., New York, N. Y., 1953. **Health and Human Relations in Germany,** Report of the Second Conference on Problems of Health and Human Relations in Germany, Williamsburg Lodge, Williamsburg, Va., December 10-15, 1950, Josiah Macy, Jr. Foundation, New York, N. Y. 30 pages.

The small book is the full report of a conference sponsored by the Josiah Macy, Jr., Foundation as the third of a series of international interdisciplinary discussions leading to the sponsorship of a Mental Hygiene Movement in Germany. A pamphlet summary of the conclusions of the second conference held at Williamsburg, Va., in 1950 is attached.

Participants included American, Canadian, British, French, Dutch, and German psychiatrists, psychologists, social and welfare workers, and several ministers. The discussions on the problem of neurosis by Henricus Ruemke and the sense of inner identity by Erik. H. Erikson are particularly interesting.

This volume would make stimulating reading to anyone concerned with the problem of mental health and its impact on international relations. It is highly recommended.

—Comdr. F. H. Ocko, MC, USN

Modern Concepts in Medicine, by *Julius Jensen*, Ph. D. (Med.). 636 pages; illustrated. The C. V. Mosby Company, St. Louis, Mo., 1953. Price $11.50.

This book is written to make common and important diseases of internal medicine easily understood. The author accomplishes this by the integration of L. L. Whyte's arguments as presented in his book, "The Next Development in Man"; Selye's theory of stress, which is emphasized throughout; and cybernetics, which is the science of control and communication in the animal and the machine.

Diseases are presented from the standpoint of their effect on the whole person and the biologic processes and factors which enable the person to respond to disease (stress).

The book is divided into four parts. Part one is a short introduction on the development of modern medical concepts, cellular activity, and the principle of adaptation. Part two, entitled "The Essential Processes of Adaptation," covers the processes of metabolism, fluid and electrolyte balance, body temperature, regulation, immune reaction, and neoplasia. Part three deals with the facilities of early, intermediary, and final stages of metabolism. It also has a chapter on the kidney, the locomotor facilities of the body, the structural responses to stressors, and the transportation (circulatory) system. Part four is concerned with cybernetics. The importance of chemistry, physics, and mathematics and their relationships to the physiology of enzymes, vitamins, hormones, and the nervous system is stressed.

This book is an excellent adjunct to standard textbooks on medicine and should be especially valuable to physicians who have been out of medical school for several years.

—Col. P. I. McShane, MC, USA

Comparative Conditioned Neuroses, edited by *Ralph Waldo Miner* and *Edward J. Kempf*. Originally published in Annals of the New York Academy of Sciences, Volume 56, Article 2, pages 141-380. Illustrated. The New York Academy of Sciences, New York, N. Y., 1953. Price $3.50.

This monograph is a collection of 15 technical articles presented at a Conference on Comparative Conditioned Neuroses in Human and other Animals, held by the Section on Psychology of the New York Academy of Sciences in February 1952. Each group of four papers is followed by a discussion. Original data are presented from experiments involving neurotic conditioning of various laboratory animals together with a review of neuroses in humans.

This volume is primarily a vehicle to launch a highly original theory of human and animal behavior by the consulting editor, Dr. Kempf, in a paper entitled, "Neuroses as Conditioned, Conflicting, Holistic, Attitudinal Acquisitive-Avoidant Reactions."

Presenting, as it does, the latest views of a group of recondite scientists in their own rather technical jargon, this book will hardly achieve its avowed purpose of mutual enlightenment of the laboratory research worker and practicing psychiatrist. The latter will do well if he is able to extract an ounce of practical value from it.—*Capt. J. T. Shurley, MC, AUS*

Slipped Capital Femoral Epiphysis, by *Armin Klein*, M. D.; *Robert J. Joplin*, M. D.; *John A. Reidy*, M. D.; and *Joseph Hanelin*, M. D. Edited by *Aubrey O. Hampton*, M. D. 130 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $6.75.

The authors' interest in slipped capital femoral epiphysis began in 1933, and in this monograph, they discuss the evolution, details, and results of their present method of treatment, stress the need for early diagnosis, and present a roentgenographic standard of "normal" hips. The first chapter contains 43 plates, each showing two views of normal hips from six days to 16 years of age. The technic for bilateral hip roentgenography and appearance of the developing normal hip are discussed briefly in the text. Separate chapters consider diagnosis, treatment, operative technic, postoperative treatment and conclusions. Nailing, in situ or after open reduction, with a Smith-Petersen nail, early ambulation, and exercise is recommended as the treatment of choice for all patients with slipped capital epiphyses. Though uniformly good results are reported, the cases fixed in situ fared far better than those requiring open reduction.

This comprehensive, well-illustrated monograph should be of great value to the radiologist, orthopedic surgeon, and pediatrician.—*Col. P. A. Paden, MC, USA*

Textbook of Histology, by *Jose F. Nonidez*, D. Sc., and *William F. Windle*, Ph. D., Sc. D. 2d edition. 528 pages; 326 illustrations, composed of 214 drawings and diagrams and 233 photomicrographs. McGraw-Hill Book Co., Inc., New York, N. Y., 1953. Price $9.50.

This second edition has brought to light the functional aspects of histology and correlates minute structure with established physiologic concepts. Controversial issues are avoided and brevity remains a keynote. Confusing details are eliminated and there is concentration on fundamentals. The bibliography is in English and has no more than five references to a chapter, each having a brief statement pertaining to the subject. The index is complete for basic subject matter and illustrations. The authors have accomplished their objective of presenting a concise book of mammalian histology that is well illustrated. It is recommended for the student, who does not need or desire great detail, as well as for the physician who may wish to refer to some controversial point in mammalian histology.—*Col. J. M. Blumberg, MC, USA*

Isotopic Tracers in Biochemistry and Physiology, by *Jacob Sacks*, Ph. D., M. D., Associate Professor of Chemistry, University of Arkansas, Fayetteville. 383 pages; illustrated. McGraw-Hill Book Co., Inc., New York, N. Y., publishers, 1953. Price $8.50.

The objectives of this book are to present a discussion of the principles on which the use of isotopic tracers is based, to describe and interpret major accomplishments in the elucidation of metabolic processes, and to call attention to the limitations to which this investigative tool is subject. These objectives are approached by a broad selection from a vast and rapidly increasing body of literature. In the selection, the author attempts to represent major contributions, to integrate results of apparently different experiments, and to illustrate problems and pitfalls. Repeated emphasis is given to two considerations in advance of employing isotopes in a study. One is to classify the problem properly among those which require isotopes for a definite answer, those for which isotopes are convenient but unessential, and those for which chemical procedures are adequate. The other regards the combined use of chemical and isotopic studies to provide data which allow fuller interpretation.

The book is organized according to subject matter rather than by isotopes. The numerous subtopics which appear under each chapter provide an outline which is prominently arranged in the format. A brief introductory account of general principles, elementary nuclear physics, instrumental considerations, and additional background material is presented in the first five chapters. Chapter 6 is a concise presentation of the scope and concepts essential to intelligent planning of tracer experiments. The remaining 10 chapters deal with the fundamental cellular processes to which tracer studies have been so successfully applied. Nine of these chapters are devoted primarily to animal physiology and biochemistry and one to photosynthesis. This portion includes the general subjects of ionic transfer, the metabolism of carbohydrates, lipids, proteins, nucleic acids and minerals, tracer studies on blood, and thyroid relationships. Within the framework of this outline the discussion is presented in general with clarity.

As an index of accessibility to the original literature the bibliography for each chapter was tabulated. Out of a total of 660 references 7 percent are to general references and the remainder to specific articles. The book should prove useful as a source of reference. The interpretations projected by the author may stimulate additional investigation.—*G. C. Kyker, Ph. D.*

Clinical Orthopaedics, *Anthony F. DePalma*, Editor-in-Chief. 242 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1953. Price $6.

This is the first volume of a new publication series designed to provide an additional needed outlet for original articles of

orthopedic interest in book form. Two issues are planned annually, each divided into two sections. The first section will be devoted to a specific topic and the second will contain articles on varied subjects. In this first issue, section one consists of 15 original articles on children's orthopedics.

This first issue contains well-selected articles by highly qualified authors fully deserving their publication in book form. The format, type, and indexing are excellent and the halftone and other reproductions are particularly good. If these high standards are continued, every orthopedic surgeon and library will want every issue in the future.—*Col. J. D. Blair, MC, USA*

The 1952 Year Book of Neurology, Psychiatry and Neurosurgery (November 1951— October 1952). Neurology, edited by *Roland P. Mackay,* M. D. Psychiatry, edited by *Nolan D. C. Lewis,* M. D. Neurosurgery, edited by *Percival Bailey,* M. D. 603 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1953. Price $6.

This year book, divided into sections on neurology, psychiatry, and neurosurgery, contains abstracts of the more important articles in these fields published in the American and foreign literature during 1952. Each section is edited by an eminent physician and teacher. Those familiar with previous editions will welcome the return of the section on neurosurgery edited by Dr. Percival Bailey whose occasional comments at the end of abstracted articles are the epitome of editorship. As the three section editors state, inclusion in one volume of abstracts of all the important literature of 1952 would be an impossibility. Nevertheless, each section contains an excellent representative selection and each editor has included abstracts of controversial articles. This year book is highly recommended to all who are interested in the fields of neurology, psychiatry, and neurosurgery.

—*Lt. Col. J. W. Sumner, MC, USA*

Teaching in Schools of Nursing, Principles and Methods, by *Loretta E. Heidgerken,* R. N., M. S., Ed. D., Associate Professor of Nursing Education, The Catholic University of America; 2d edition. 596 pages. J. B. Lippincott Co., Philadelphia, Pa., publishers, 1953. Price $5.

This book presents in a compact form the correlation of principles and practice which is essential in the teaching of nursing as well as in nursing itself. It was designed to assist the teacher in preparing for her important task and as a reference in schools of nursing.

As in the first edition, the book is comprised of six sections. The first concerns the basic factors of the teaching—learning situation in education and its application to nursing education. An excellent, detailed discussion of philosophy is presented and its aims and objectives as they relate to nursing education. The second section comprises the characteristics of learning,

types of learning, conditions affecting learning, and the environment for learning. The planning, organization, and direction of learning activities is included in section three, and the various methods of teaching and the advantages and disadvantages of each are described in section four. Section five contains a brief, but thorough, discussion of the various types of audiovisual aids, their proper use, and suggested methods of handling in a school of nursing. During the past few years, the use of radio and television in education has been undergoing considerable research and its use and limitations in schools of nursing is also discussed. The final section is concerned with the basic principles of evaluation and measurements of the outcomes of learning and teaching. Only general principles are presented in this section and the student is referred to other texts for more detailed discussions of the evaluation methods.

Bibliographic footnotes are found throughout the book and a more complete bibliography and suggested reading material follows each chapter. A fairly complete index at the end of the book enhances its value as a ready reference. The student of nursing and nursing education will find this volume an excellent source of reference. It also will serve as a valuable guide for administrators, teachers, and graduate nurses.

—Maj. A. E. Brimmer, USAF (NC)

An Atlas of the Commoner Skin Diseases, by *Henry C. G. Semon,* M. A., D. M. Oxon., F. R. C. P., London, Consulting Physician for Diseases of the Skin, and former Lecturer to Postgraduates, Royal Northern Hospital. Consulting Dermatologist, Hampstead and North-West London General Hospital. Ex-president and Vice-president, Dermatological Section, Royal Society of Medicine. Corresponding Member of the Société Francaise de Dermatologie et Syphilologie. Médaille d'Honneur de l'Assistance Publique, République Française. Medical Referee for Industrial Dermatitis, Ministry of Francaise. Medical Referee for Industrial Dermatitis, Ministry of National Insurance. Color photography originally directed by the late *Arnold Moritz,* B. A., M. B., B. C. Cantab. 4th edition. 371 pages; illustrated with 147 plates reproduced by direct color photography from the living subject. The Williams & Wilkins Co., Baltimore, Md., publishers, 1953. Price $13.50.

The fourth edition of this atlas justifies perpetuation of photographic reproduction of skin diseases. Eight new plates have been added to the atlas which are extremely good and demonstrate the recent advances in medical color photography. The author has succeeded in presenting a well-rounded picture of the diseases of the skin in one hundred and forty-seven illustrations. The descriptive text accompanying each illustration is presented with etiologic factors and practical therapy. Both nomenclature and medicaments are akin to the American usage. The author's description of pustular psoriasis and pustular bacterid does not conform with today's conception of these diseases. His reluctance to use antibiotics in the treatment of impetigo for fear of sensitiza-

tion seems to be antiquated in light of the new antibiotics with low sensitization indices.

This atlas should prove to be useful especially for the general practitioner who is remote from expert opinion. It is a valuable book in the physician's library.

—Lt. Col. A. N. Domonkos, USAFR (MC)

Dermatology in General Practice, by *Jacob Hyams Swartz*, M. D., Assistant Professor of Dermatology, Harvard Medical School and Post-Graduate School; Consulting Dermatologist, Massachusetts General Hospital; Member, American Dermatological Association, American Mycological Association; Diplomate, American Board of Dermatology. Foreword by *C. Guy Lane*, M. D., Professor Emeritus, Department of Dermatology, Harvard Medical School; Consulting Dermatologist, Massachusetts General Hospital. 581 pages; illustrated. The Williams & Wilkins Co., Baltimore, Md., publishers, 1953. Price $11.

Although this text is written primarily for general practitioners, medical students, and nurses, it is surprisingly broad in scope and not only deals with the more common skin diseases but also briefly with many of the more unusual skin conditions.

The sections on the care of normal and abnormal skin, including a description of the technics of various therapeutic procedures, such as baths, wet dressings, and application of different types of medications, are good and usually not found in textbooks of this nature.

Although the clinical description of each skin disease is rather brief, there are many excellent charts giving a differential diagnosis and an abundance of good typical photographs which would be better if they were in color instead of black and white. Therapy is stressed and is concise and fairly complete. The classification of leprosy is obsolete and does not conform with that adopted by the Fifth International Leprosy Congress in Havana in 1948. The chapter on mycotic infections is of special note as the author is an outstanding authority in this field. This is an excellent text for the purpose for which it was written.

—Lt. Col. O. S. Olsen, MC, USA

The 1952 Year Book of Pathology and Clinical Pathology. Pathology, edited by *Howard T. Karsner*, M. D. Clinical Pathology, edited by *Arthur Hawley Sanford*, M. D. 400 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1953. Price $5.50.

The editors have abstracted articles for this volume from more than 100 medical journals, including 30 journals from other countries. The journals reviewed were not limited to the field of pathology and clinical pathology but included all phases of medicine. From this voluminous material have been abstracted the most important articles pertaining to the activities of the pathologist. The section on pathology is enhanced by frequent editorial

comment. Chemistry abstracts predominate in the section on clinical pathology and include several abstracts on paper chromatography and electrophoresis. As the editor states in his introduction, the value of these methods in the clinical pathology laboratory is yet to be determined. This book provides an excellent review of pathology literature for 1952 and is recommended to all interested in laboratory medicine.—*Col. H. R. Gilmore, Jr., MC, USA*

Oral Fat Emulsions, edited by *Roy Waldo Miner* and *Fredrick J. Stare*. Originally published in Annals of the New York Academy of Sciences, Volume 56, Article 1, pages 1-139. The New York Academy of Sciences, New York, N. Y., 1953.

This is a compilation of papers presented at a conference held by the section of Biology of the New York Academy of Sciences on 29 April 1952. Fat has been maligned as the cause of all of the degenerative and many other woes of mankind. It is the best source of energy, however, because each gram yields 2.3 times as many calories as carbohydrate or protein, contains essential fatty acids, adds palatability to food, has excellent storage capability, and has the lowest specific dynamic action. These papers reveal the experimental and physiologic bases for the importance of fat in the diet, the physiology of fat absorption, the value of fat emulsions in clinical conditions, particularly emaciation, malnutrition, burns, renal failure, benign obstructing lesions of the gastrointestinal tract, anterior poliomyelitis, and growth of children.

This book would be of extreme value to internists and others interested in problems of metabolism and nutrition. Each article has a comprehensive bibliography and the format of the bibliography is styled in the manner this reviewer hopes all will copy.

—*Capt. J. Love, MC, USN*

Textbook of Exodontia, by *Leo Winter*, D. D. S., M. D., Sc. D. (Hon.), LL. D. Revised by *William F. Harrigan*, A. B., D. D. S., M. D., and *Leo Winter, Jr.*, D. D. S. 6th revised edition. 350 pages; 385 illustrations and 1 color plate. The C. V. Mosby Co., St. Louis, Mo., 1953. Price $8.

In the sixth edition of this book the authors have presented a simple approach to some of the basic principles in the field of exodontia and oral surgery for the student and the general practitioner. The illustrations, most of which may be found in the previous editions, exemplify some of the time-tested technics of exodontia. Though repetitious in part, an attempt is made to impress the reader with the necessity for a sound surgical approach.

The authors have omitted the subject of general anesthesia, which belongs in a text dealing with exodontia because, in the final analysis, the responsibility for the patient's welfare rests in the hands of the surgeon. The addition of chapters on diagnosis

and history taking, chemotherapy and antibiotics, hemorrhage, and alveoplasty serves a useful purpose. In view of the rapid and substantial advance in the specialty of oral surgery, the chapter on diagnosis and history taking has particular merit. Important information can be derived from careful analysis of the authors' approach to this phase of the problems presented by the oral surgical patient.

The concise manner in which the various phases are presented is commendable, and the index and bibliography are adequate. This book offers the student entering the field a practical text and the general practitioner a reliable guide to the specialty.

—Comdr. E. R. Hildreth, DC, USN

Therapeutics in Internal Medicine, by 84 *Authorities*. Edited by *Franklin A. Kyser*, M. D. 2d edition, completely revised and reset. 830 pages. Hoeber-Harper, New York, N. Y., publishers, 1953. Price $15.

This book is an excellent compilation of the treatment of diseases. It includes in this second edition many of the recent advances in the therapy of those maladies which are in the province of the internist. The latest in the treatment of specific conditions are outlined in detail. Each discussion of therapy gives several concepts, but emphasizes the method preferred by the author of the section. The articles on metabolic diseases include many detailed diets in addition to the basic therapeutic measures. Where there are prophylactic methods for a disease, these are fully discussed.

The broad scope attempted by this book results in certain weak points. Some of the therapeutic regimens are sketchy (for example, that for pneumothorax) and omit the most recent advances. The section on hemochromatosis does not include any comment on the methods of therapy recently suggested for this disease. Sarcoidosis is not mentioned. In spite of some deficiencies, the book is a good reference manual on treatment and should be of value to the medical student and the practitioner.

—Comdr. H. A. Lyons, MC, USN

BOOKS RECEIVED

Books received by the *U. S. Armed Forces Medical Journal* are acknowledged in this department. Those of greatest interest will be selected for review in a later issue.

Quantitative Pharmaceutical Chemistry, by *Glenn L. Jenkins*, Ph. D., Professor of Pharmaceutical Chemistry and Dean of the School of Pharmacy, Purdue University; *John E. Christian*, Ph. D., Professor of Pharmaceutical Chemistry, School of Pharmacy, Purdue University; and *George P. Hager*, Ph. D., Professor of Pharmaceutical Chemistry, School of Pharmacy, University of Maryland. 4th edition. 534 pages; illustrated. McGraw-Hill Book Co., Inc., New York, N. Y., 1953. Price $6.50.

A Practice of Thoracic Surgery, by *A. L. d'Abreu*, O. B. E., Ch. M., F. R. C. S., Thoracic Surgeon, Queen Elizabeth Hospital and the Children's Hospital, United Birmingham Hospitals; Consultant adviser in Thoracic Surgery, Birmingham Regional Hospital Board; Thoracic Surgeon Hill Top Hospital, Bromsgrove, and the Birmingham Tuberculosis Service; Lecturer in Surgery, University of Birmingham; Late Assistant Director of the Professorial Surgical Unit of the Welsh National School of Medicine, Cardiff; Hunterian Professor, Royal College of Surgeons; Late Lieutenant-Colonel, R. A. M. C. 591 pages; illustrated. The Williams & Wilkins Co., Baltimore, Md., 1953. Price $14.50.

The Insight Test, A Verbal Projective Test For Personality Study, by *Helen D. Sargent*, Ph. D., Senior Psychologist, Education Department, Menninger Foundation. Foreword by *Pearl G. Knapp*, Ph. D., Chief Psychologist, Los Angeles Psychiatric Service. 276 pages. Grune & Stratton, Inc., New York, N. Y., 1953. Price $6.75.

Clinical Unipolar Electrocardiography, by *Bernard S. Lipman*, A. B., M. D., Instructor in Medicine, Emory University School of Medicine; Consultant, Cardiac Clinic, Grady Hospital; Cardiac Consultant, Veterans' Administration Regional Office, Atlanta, Ga., and *Edward Massie*, A. B., M. D., F. A. C. P., Assistant Professor of Clinical Medicine, Washington University School of Medicine; Director of Heart Stations, Barnes Hospital and Jewish Hospital, St. Louis; Director, Cardiovascular Clinic, Washington University Clinics; Area Consultant in Cardiology to the Veterans' Administration. 309 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1953. Price $6.50.

Antibiotics, by *Robertson Pratt*, Ph. D., Professor of Pharmacognosy and Plant Physiology, University of California College of Pharmacy; Consultant on Antibiotics; and *Jean Dufrenoy*, D. Sc. (Paris), Research Associate in Antibiotics, University of California College of Pharmacy. 2d edition. 398 pages; 87 illustrations, including one plate in full color. J. B. Lippincott Co., Philadelphia, Pa., 1953.

Handbook of Differential Diagnosis, by *Harold Thomas Hyman*, M. D., author of An Integrated Practice of Medicine. 716 pages. J. B. Lippincott Co., Philadelphia, Pa., 1953.

Introduction to Laboratory Chemistry, by *L. Earle Arnow,* Ph. G., B. S., Ph. D., M. B., M. D., Director of Research, Sharp & Dohme Division, Merck & Co., Inc., West Point, Pa.; Professor of Chemistry, Bryn Mawr College Summer School of Nursing, Bryn Mawr, Pa., 1941-1943, 1945; formerly Assistant Professor of Physiological Chemistry, University of Minnesota Medical School, and Lecturer in Physiological Chemistry to Students Enrolled in the University of Minnesota, School of Nursing, Minneapolis, Minn. Revised with the assistance of *Marie C. D'Andrea,* R. N., B. S. in Nursing Education, Educational Director, School of Nursing, St. Vincent's Hospital, Indianapolis, Ind. 4th edition. 108 pages; illustrated. The C. V. Mosby Co., St. Louis, Mo., 1953. Price $1.50.

Introduction to Physiological and Pathological Chemistry, by *L. Earle Arnow,* Ph. G., B. S., Ph. D., M. B., M. D., Vice President and Director of Research, Sharp & Dohme Division of Merck & Co., Inc., West Point, Pa.; Professor of Chemistry, Bryn Mawr College Summer School of Nursing, Bryn Mawr, Pa., 1941-1943, 1945; formerly Assistant Professor of Physiological Chemistry, University of Minnesota Medical School, and Lecturer in Physiological Chemistry to Students Enrolled in the University of Minnesota, School of Nursing, Minneapolis, Minn. Revised with the assistance of *Marie C. D'Andrea,* R. N., B. S. in Nursing Education; Educational Director, School of Nursing, St. Vincent's Hospital, Indianapolis, Ind. 4th edition. 508 pages; illustrated. The C. V. Mosby Co., St. Louis, Mo., 1953. Price $3.75.

Living With A Disability, by *Howard A. Rusk,* M. D., and *Eugene J. Taylor,* in collaboration with *Muriel Zimmerman,* O. T. R., and *Julia Judson,* M. S., The Institute of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center. 207 pages; illustrated. The Blakiston Co., Inc., Garden City, N. Y., 1953. Price $3.50.

Manic Depressive Disease, Clinical and Psychiatric Significance, by *John D. Campbell,* M. D., Diplomate, American Board Psychiatry and Neurology; Fellow, American Psychiatric Association; Attending Psychiatrist, Georgia Baptist Hospital and St. Joseph's Infirmary, Atlanta; Chief Psychiatrist, Peachtree Sanitarium, Atlanta; Captain, MC, USNR. 403 pages; J. B. Lippincott Co., Philadelphia, Pa., 1953.

Renal Function, Transactions of the Fourth Conference, October 22, 23, and 24, 1952, New York, N. Y., edited by *Stanley E. Bradley,* M. D., Associate Professor of Medicine, Columbia University, College of Physicians and Surgeons, New York, N. Y. 189 pages; illustrated. Sponsored by the *Josiah Macy, Jr. Foundation,* New York, N. Y., 1953.

Atomic Weapons in Land Combat, by *G. C. Reinhardt,* Col., C. E., USA, and *W. R. Kintner,* Lt. Col., Inf., USA. 182 pages; illustrated. The Military Service Publishing Co., Harrisburg, Pa., 1953. Price $3.95.

A Text-Book of Pathology, An Introduction to Medicine, by *William Boyd,* M. D., Dipl. Psych., M. R. C. P. (Edin.), F. R. C. P. (Lond.), F. R. C. S. (C), LL. D. (Sask.), D. Sc. (Man.), M. D. (Oslo), F. R. S. (C); Professor of Pathology, University of British Columbia, Vancouver, B. C., Canada. 6th edition, thoroughly revised. 1,024 pages; 570 illustrations and 32 colored plates. Lea & Febiger, Philadelphia, Pa., 1953. Price $12.50.

Tests and Standards for New and Nonofficial Remedies, Containing Tests and Standards for Nonofficial Drugs and Dosage Forms which Stand Accepted by the Council on Pharmacy and Chemistry of the American Medical Association on January 1, 1953. Issued by *The Chemical Laboratory, American Medical Association,* 1953. 327 pages. J. B. Lippincott Co., Philadelphia, Pa., 1953. Price $4.

Bailey's Text-Book of Histology, revised by *Philip E. Smith,* Ph. D., Sc. D., Professor Emeritus of Anatomy, College of Physicians and Surgeons, Columbia University, and *Wilfred M. Copenhaver,* Ph. D., Professor of Anatomy, College of Physicians and Surgeons, Columbia University; with the assistance of *Dorothy D. Johnson,* Ph. D., Assistant Professor of Anatomy, College of Physicians and Surgeons, Columbia University. 13th edition. 775 pages; illustrated. The Williams & Wilkins Co., Baltimore, Md., 1953. Price $9.

Surgical Technique and Principles of Operative Surgery, by *A. V. Partipilo,* M. D., F. A. C. S., Associate Clinical Professor of Surgery, The Stritch School of Medicine of Loyola University; Senior Attending Surgeon, Columbus Hospital; Senior Attending Surgeon, St. Mary's Hospital; Attending Surgeon, Chief, Surgical Staff, Mother Cabrini Hospital; Consulting Surgeon, Chicago State Hospital; Consulting Surgeon, Cuneo Memorial Hospital, Chicago, Ill.; Lt. Colonel, MC, AUS, Inactive; with 10 contributors. Foreword by *Alton Ochsner,* M. D., F. A. C. S., William Henderson Professor and Director of the Department of Surgery, Tulane University School of Medicine, New Orleans, La. 5th edition, thoroughly revised. 704 pages; 548 figures containing 998 illustrations, original illustrations by *W. C. Shepard* and *Hooker Goodwin.* Lea & Febiger, Philadelphia, Pa., 1953. Price $15.

Advances in Pediatrics, edited by *S. Z. Levine,* Cornell University Medical College, New York, and associate editors: *John A. Anderson,* Stanford University School of Medicine, San Francisco; *Margaret Dann,* Cornell University Medical College, New York; *L. Emmett Holt, Jr.,* New York University College of Medicine, New York; *A. Ashley Weech,* University of Cincinnati College of Medicine, Cincinnati; and *Myron E. Wegman,* Pan American Sanitary Bureau, World Health Organization, Washington, D. C. Vol. 6. 323 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1953. Price $7.50.

The Physics of Radiation Therapy, by *Harold Elford Johns,* M. A., Ph. D., F. R. S. C., Professor of Physics, University of Saskatchewan; Physicist, Saskatchewan Cancer Commission, Saskatoon, Saskatchewan, Canada. American Lecture Series, Publication Number 116, A Monograph in the Bannerstone Division of American Lectures in Radiation Therapy, edited by *Milton Friedman,* M. D., Associate Professor of Radiology, New York University Post-Graduate Medical School; Associate Radiologist, University Hospital; Attending Radiotherapist, Hospital for Joint Diseases; Visiting Radiation Therapist, Bellevue Hospital; Senior Consultant in Radiation Therapy, Veterans Administration; Consultant, Walter Reed General Hospital; Consultant in Radiation, National Bureau of Standards and United States Public Health Service, Washington, D. C. 286 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $8.50.

Nutritional Studies in Adolescent Girls and Their Relation to Tuberculosis, by *Joseph A. Johnston,* M. D., Pediatrician-in-Chief, Henry Ford Hospital and The Edsel B. Ford Institute for Medical Research, Detroit, Mich. 320 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $7.50.

Atlas of Regional Dermatology, by *Ernest K. Stratton,* P. D., M. D., Research Associate, The George Williams Hooper Foundation for Medical Research, University of California Medical Center, San Francisco, Calif.; *Harry L. Arnold, Jr.,* M. D.; *Maurice J. Costello,* M. D.; *Lewis A. Koplik,* M. D.; and *Paul Fasal,* M. D. 274 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $15.

May's Manual of the Diseases of the Eye, For Students and General Practitioners. 21st edition, revised and edited by *Charles A. Perera,* M. D., Associate Clinical Professor, College of Physicians and Surgeons, Columbia University, New York; Attending Ophthalmologist, Presbyterian Hospital, New York. 512 pages; 378 illustrations, including 32 plates, with 93 colored figures. Williams and Wilkins Co., Baltimore, Md., 1953. Price $6.

Study Guide for Clinical Nursing, A Co-ordinated Survey Integrated with Essentials of the Basic Sciences, prepared under the direction of *Emily C. Cardew,* R. N., M. S., Acting Director, University of Illinois School of Nursing, Chicago, Ill. Departmental Contributors: In Psychiatry, *Martha M. Brown,* R. N., M. A., Assistant Director, School of Nursing, Washington University, St. Louis, Mo.; In Surgery, *Lillian Sholtis Brunner,* R. N., M. S., Formerly Assistant Professor of Surgical Nursing, Yale University School of Nursing, New Haven, Conn.; In Obstetrics, *Jayne DeClue,* R. N., B. S., Assistant Professor of Obstetric Nursing, University of Pittsburgh, School of Nursing, Pittsburgh, Pa.; In Medicine, *Jane Taylor Torrance,* R. N., B. S., M. Ed., Visiting Lecturer in Nursing Education, University of Akron, Akron, Ohio; Formerly Lecturer, Frances Payne Bolton School of Nursing, Western Reserve University, Cleveland, Ohio; In Pediatrics, *Gladys Wilkins,* R. N., M. A., Associate Professor of Pediatric Nursing, University of Pittsburgh, School of Nursing, Pittsburgh, Pa. 563 pages. J. B. Lippincott Co., Philadelphia, Pa., 1953. Price $6.

The Obstetrical Forceps, by *L. V. Dill,* M. D., F. A. C. S., Head, Obstetrics and Gynecology, Yater Clinic; Assistant Professor, Obstetrics and Gynecology, Georgetown University School of Medicine; Consultant, Obstetrics and Gynecology, Army Medical School and Walter Reed General Hospital; Staff Member, Obstetrics and Gynecology, Providence Hospital, Washington, D. C.; Formerly, Instructor in Obstetrics and Gynecology, Cornell University Medical College, New York, N. Y. American Lecture Series, Publication Number 150, A Monograph in the Bannerstone Division of American Lectures in Gynecology and Obstetrics, edited by E. *C. Hamblen,* B. S., M. D., F. A. C. S., Professor of Endocrinology, Associate Professor of Obstetrics and Gynecology, Duke University School of Medicine; Chief of the Division of Endocrinology and Endocrinologist, Duke Hospital, Durham, N. C. 156 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $5.25.